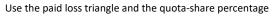
Paper: Problem: Problem Type:	CCIR.ARinstr calculate (A,B,C,D,E,F,G,H,J,K) - there is no "I" 2018.Fall #16	(Alphabet City (Model 18.F Q16)) 05 a-Question
Balance Sheet	Page 20.10 Asset recoverable from reinsurers:	2017 2016
	UEP	n/a 2,100 <== ceded values
	UCAE	A 3,600 <== ceded values
	total investments including cash	46,100 29,100
	Page 20.20 Liabilities & Equity	2017 2016
	UEP	J 3,500 <== gross values
	UCAE	B 6,000 <== gross values
Income	Page 20.30 Statement of Income	2017 2016
Statement	NWP	23,000 18,100
	NEP	20,200 n/a
	GROSS claims & adjustment expenses	C n/a
	REINSURER'S SHARE of claims & adj exps	D n/a
	NET claims & adjustment expenses NET investment income	E n/a
	NET investment income	2,700 n/a
Runoff	Page 60.41 Net Clms & Adj Exps Runoff	AY 2017
СҮ	Discounted	AY 2016 AY 2017 & prior
2016	UCAE end of year	1,900
	IBNR end of year	2,100
2017	Paid during year	F n/a n/a
	UCAE end of year	1,100 n/a 3,000
	IBNR end of year	1,900 n/a K
	investment income from UCAE & IBNR	G
	Amount: excess/deficiency Ratio: excess/deficiency	n/a H
	Ratio: excess/deficiency	
Bond	rating class book val. mkt. val.	duration yield
Portfolio	govt HTM 8,000 8,320	0.7 1.3%
	AAA HTM 15,000 12,300	11.0 2.4%
	A HTM 11,000 9,900	2.0 5.3%
Triangle	GROSS paid loss (cumulative)	GROSS unpaid loss ( <u>un</u> discounted)
Data	AY 12 24	AY 12 24
Butu	2016 1,600 5,100	2016 n/a 4,100
	2017 1,600	2017 6,300
Payment		MfAD (claims): 16.00%
Pattern		MfAD (re): 2.00%
(incremental)	year 3 60%	MfAD (inv): 1.00%
		* reinsurance quota-share RETENTION ==> 40%

Step 1:	calculate the	discount ra	ite as a weig	hted avera	ge of the yield	s in the bon	d portfolio			
	weight *	yield		* weight =	(book value)	x duration				
	5,920	1.3%								
	165,000	2.4%								
	22,000	5.3%								
		2.70%	<== discour	nt rate						
	_									
Step 2a:	calculate the	e <u>gross</u> PV fo	or AY 2017 ar	nd AY 2016	( <u>qross</u> of quo	ta-share rei	<i>nsurance)</i> at		<u>2.70%</u>	
	AY 2017:	unpaid	=	6,300	(at 12 monti	hs)				
		PV <sub>17</sub>	=	20%	/	80%	x	6,300	/	1.027 ^ 0.5
			+	60%	/	80%	x	6,300	/	1.027 ^ 1.5
			=	1,554	, +	4,540		-,	,	
			=	6,094		,				
	AY 2016:	unpaid	=	4,100	(at 24 monti	hs)				
		-								
		$PV_{16}$	=	60%	/	60%	х	4,100	/	1.027 ^ 0.5
			=	<u>4,046</u>						
	==>	gross	PV for both /	AYs at:	2.70%	is	10,140			
Step 2b:	calculate the	gross PV fo	or AY 2017 ar	nd AY 2016	( <u>gross</u> of quo	ta-share rei	<i>nsurance)</i> at		<u>1.70%</u>	
	==>	gross	PV for both /	AYs at:	<b>1.70%</b>	is	10,234	(similar cal	culation to	Step 1)
Chan 2			10 22 4		10.000/		10.110		44.057	
Step 3a:	gross APV	=	10,234	+	16.00%	х	10,140	=	11,857	
Step 3b:	net APV	=	10,234	x	40%					
	-	+	10,140	х	40%	х	16.00%			
		+	10,140	х	60%	х	2.00%			
		=	4,864							
	_			-						
Step 3c:	ceded APV	=	11,857	-	4,864	=	6,992			

A & B are very easy: (	<u>B</u> is the r	net claims <b>liability</b> , <u>A</u> is	the reinsuran	ce recoverable <b>asset</b> )		
А	=	6,992	UCAE recov	verable from reinsurer	(Step 3c)	
В	=	11,857	gross UCAE	liability	(Step 3a)	
C, D & E are more confusir	ng:					
С	=	the GROSS "income" d	ue to GROSS	claims in 2017 (think of	it as <b>negativ</b>	<b>e</b> income)
	=	(2017 gross UCAE)	-	(2016 gross UCAE)	+	(gross paid in 2017) *
	=	В	-	given info	+	from paid triangle
	=	11,857	-	6,000	+	5,100
	=	10,957				
* (gross paid	in 2017)					
	=	2016@24 -	2016 @ 12	+ 2017@1	12	
	=	5,100 -	1,600	+ 1,600		
	=	5,100				
D	= = = =	the CEDED "income" d (2017 ceded UCAE) A 6,992 6,452	lue to CEDED ( - - -	claims in 2017 ( <i>this is a</i> (2016 ceded UCAE) <i>given info</i> 3,600	recoverable , + + +	) (ceded paid in 2017) ** see below 3,060
* (ceded paid	in 2017)					
	= '	gross paid in 2017	х	60%		
	=	5,100	х	60%		
	=	3,060				
		net "income" due to c	laims in 2017	(this is also <b>negative</b> ii	ncome)	
Е	=					
E	=	C -	D			
E			D 6,452			
E	=	C -				

F is easy: if you know that the year labels in the left column of the table represent Calendar Years and the year labels in the top row represent Accident Years





G & H are related:

related: <u>H</u> is the excess (deficiency) ratio and <u>G</u> is the investment income in the excess (deficiency) formula

You might like to review the practice template for the excess (defiency) ratio before proceeding! In any case, we first need to calculate G. Note that UCAE + IBNR are directly from the Runoff exhibit in the given info.

G	=	(investment	yield) *	х	avg [ (UCAE	+IBNR) <sub>beg of 1</sub>	7, (UCAE + IBN	NR) <sub>end of 17</sub> ]
	=	7.45%		х	avg [	4,000	,	3,000
	=	261						
* investmer	nt yield							
	=	2	х	NII				
	,	/ [ (invested a	ssets) <sub>beg of 17</sub>	+ (invested	assets) <sub>end of 1</sub>	<sub>17</sub> - NII ]		
	=	2	х	2,700				
		/ [	46,100	+	29,100	-	2,700	]
	=	7.45%						
NII or net in	vestment	income comes	from the <b>Inc</b>	ome Stater	nent			
invested ass	sets come	from the <b>Balan</b>	ce Sheet					
				ome Stater	nent			

= [ (UCAE + IBNR)<sub>AY16 @ 12</sub> - (UCAE + IBNR)<sub>AY16 @ 24</sub> - (net Pd)<sub>12-24</sub> + G ] / (UCAE + IBNR)AY16 @ 12

Now:

Н

(UCAE + IBNR) <sub>AY16 @ 12</sub>	=	1,900	+	2,100	=	4,000
(UCAE + IBNR) <sub>AY16 @ 24</sub>	=	1,100	+	1,900	=	3,000
(net Pd) <sub>12-24</sub>	=	F			=	1,400

Therefore:

н

=

-3.5% <== Excess (Deficiency) Ratio

Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,500 < == from Page 20.20 Balance Sheet(ceded UEP)_{16} = 2,100 <== from Page 20.10 Balance SheetThe result is:(net UEP)_{17} = 4,200And finally, using the quota-share percentage to GROSS UP this net value, we obtain:(gross UEP)_{17} = (net UEP)_{17} / 40\%J = 4,200 / 40\%J = 0.0500hally):K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case(net APV)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}where(net Case)_{17 & prior} = 3,000 <== from Step 3b(net Case)_{17 & prior} = 3,000 <== from Runoff Exhibit (2017 UCAE for 2017 & prior)thereforeK = 4,864 = 3,000K = 4,864 = -3,000= 1,864to Summary:\boxed{A = 6,992 \\ B = 11,857 \\ D = 6,452}\boxed{B = 2,615 \\ J = 10,500}$	Recail the							
$NEP_{17} = NWP_{17} - [(net UEP)_{17} - (ret UEP)_{16}]$ $20,200 = 23,000 - [(net UEP)_{17} - (ret UEP)_{16} - (ceded UE)$ $Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: (gross UEP)_{16} = 3,500 <= from Page 20.20 Balance Sheet (ceded UEP)_{16} = 2,100 <= from Page 20.10 Balance Sheet (ceded UEP)_{16} = 2,100 <= from Page 20.10 Balance Sheet The result is: (net UEP)_{17} = 4,200 And finally, using the quota-share percentage to GROSS UP this net value, we obtain: (gross UEP)_{17} = (net UEP)_{17} / 40% J = (10,500) / 40% J = (10,500) / 40% K is (net IBNR)_{17.8, prior} = (net APV)_{17.8, prior} - (net Case)_{17.8, prior}$ where (net APV)_{17.8, prior} = 4,864 <== from Step 3b (net Case)_{17.8, prior} = 3,000 <== from Runoff Exhibit (2017, UCAE for 2017.8, prior) therefore K = 4,864 - 3,000 = (1,864) = -3,000		EP	=	WP	-	chg(UEP)		
$NEP_{17} = NWP_{17} - [(net UEP)_{17} - (ret UEP)_{16}]$ $20,200 = 23,000 - [(net UEP)_{17} - (ret UEP)_{16} - (ceded UE)$ $Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: (gross UEP)_{16} = 3,500 <= from Page 20.20 Balance Sheet (ceded UEP)_{16} = 2,100 <= from Page 20.10 Balance Sheet (ceded UEP)_{16} = 2,100 <= from Page 20.10 Balance Sheet The result is: (net UEP)_{17} = 4,200 And finally, using the quota-share percentage to GROSS UP this net value, we obtain: (gross UEP)_{17} = (net UEP)_{17} / 40% J = (10,500) / 40% J = (10,500) / 40% K is (net IBNR)_{17.8, prior} = (net APV)_{17.8, prior} - (net Case)_{17.8, prior}$ where (net APV)_{17.8, prior} = 4,864 <== from Step 3b (net Case)_{17.8, prior} = 3,000 <== from Runoff Exhibit (2017, UCAE for 2017.8, prior) therefore K = 4,864 - 3,000 = (1,864) = -3,000	A 1 11 1							
$20,200 = 23,000 - [(net UEP)_{17} - ((gross UEP)_{16} - (ceded UE)_{16}]$ Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,500 <= from Page 20.20 Balance Sheet (ceded UEP)_{15} = 2,100 <= from Page 20.10 Balance Sheet The result is: (net UEP)_{17} = 4,200 And finally, using the quota-share percentage to GROSS UP this net value, we obtain:(gross UEP)_{17} = (net UEP)_{17} / 40\% J = 4,200 / 40\% J = 10,500 hally):K is (net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 4,864 <= from Step 3b$ $(net Case)_{17 & prior} = 3,000 <== from Runoff Exhibit (2017 UCAE for 2017 & prior)$ $K = 4,864 - 3,000$ $= 1,864$ tion Summary: $\frac{A = 6,992}{B = 11,857}$ $\frac{F = 1,400}{G = 2615}$ $\frac{F = 1,400}{B = 10,500}$	Apply this	to our situatio	on to obtain	1:				
Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,500 <== from Page 20.20 Balance Sheet (ceded UEP)_{16} = 2,100 <== from Page 20.10 Balance Sheet The result is: (net UEP)_{17} = 4,200 And finally, using the quota-share percentage to GROSS UP this net value, we obtain:(gross UEP)_{17} = (net UEP)_{17} / 40\% J = 4,200 / 40\% J = 10,500 hally):K is (net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 4,864 <== from Step 3b$ $(net Case)_{17 & prior} = 3,000 <== from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore K = 4,864 - 3,000 $= 1,864$ tion Summary: $\frac{A = 6,992}{B = 11,857}$ $\frac{F = 1,400}{H = -3.5\%}$ $J = 10,500$		NEP <sub>17</sub>	=	NWP <sub>17</sub>	-	[ (net UEP)	17 - (net UEP)1	<sub>6</sub> ]
$ \begin{array}{rcrcr} (\text{gross UEP})_{16} &=& 3,500 \\ (\text{ceded UEP})_{16} &=& 2,100 \end{array} < == from Page 20.20 Balance Sheet \\ (\text{ceded UEP})_{16} &=& 2,100 \end{array} < == from Page 20.10 Balance Sheet \\ \hline \\ \text{The result is:} \\ & (\text{net UEP})_{17} &=& 4,200 \\ \text{And finally, using the quota-share percentage to GROSS UP this net value, we obtain:} \\ & (\text{gross UEP})_{17} &=& (\text{net UEP})_{17} & / & 40\% \\ & \text{J} &=& 4,200 & / & 40\% \\ & \text{J} &=& 10,500 \\ \hline \\ \text{nally}: \text{ K is (net IBNR})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\ \hline \\ \hline \\ \text{(net APV)}_{17 \text{ & prior}} &=& 4,864 \\ (\text{net APV})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\ \hline \\ \text{(net Case})_{17 \text{ & prior}} &=& 4,864 \\ (\text{net Case})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\ \hline \\ \hline \\ \text{(net Case})_{17 \text{ & prior}} &=& 4,864 \\ (\text{net Case})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\ \hline \\ \hline \\ \hline \\ \text{(net Case})_{17 \text{ & prior}} &=& 4,864 \\ (\text{net Case})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\ \begin{array}{c} \text{(net Case})_{17 \text{ & prior}} \\ \text{(net Case})_{17 \text{ & prior}} \text{ and the standard formula is IBNR = (Total Liabilities) - Case } \\ \hline \\$		20,200	=	23,000	-	[ (net UEP)	<sub>17</sub> - ( (gross UE	P) <sub>16</sub> - (ceded UE
$(ceded UEP)_{16} = 2,100 < = from Page 20.10 Balance Sheet$ The result is: $(net UEP)_{17} = 4,200$ And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $(gross UEP)_{17} = (net UEP)_{17} / 40\%$ $J = 4,200 / 40\%$ J = 10,500 hally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case $(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net Case)_{17 & prior} = 4,864 <= from Step 3b$ $(net Case)_{17 & prior} = 3,000 <= from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore K = 4,864 - 3,000 $= 1,864$ $K = 4,864 - 3,000$ $= 1,864$	Ok, this is	getting messy	so I'm goin	g to let you do	o the algeb	ra. Substitute	these values	above:
The result is: $(net UEP)_{17} = 4,200$ And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $(gross UEP)_{17} = (net UEP)_{17} / 40\%$ $J = 4,200 / 40\%$ $J = 10,500$ hally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case $(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net Case)_{17 & prior} = 4,864 < = from Step 3b$ $(net Case)_{17 & prior} = 3,000 < = from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore $K = 4,864 - 3,000$ $= 1,864$ $\frac{F = 1,400}{G = 261}$ $\frac{F = 1,400}{G = 261}$ $H = -3,5\%$ $J = 10,550$		(gross UEP) <sub>16</sub>	=	3,500	<== from	Page 20.20	Balance Shee	t
$ (\text{net UEP})_{17} = 4,200 $ And finally, using the <b>quota-share percentage</b> to GROSS UP this net value, we obtain: $ (gross UEP)_{17} = (\text{net UEP})_{17} / 40\% \\ J = 10,500 $ hally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case $ (\text{net IBNR})_{17 & prior} = (\text{net APV})_{17 & prior} - (\text{net Case})_{17 & prior} $ where $ (\text{net APV})_{17 & prior} = 4,864  <== from Step 3b \\ (\text{net Case})_{17 & prior} = 3,000  <== from Runoff Exhibit ( 2017 UCAE for 2017 & prior therefore) $ $ K = 4,864 - 3,000 \\ = 1,864 $ tion Summary: $ \boxed{ A = 6,992 \\ B = 11,857 \\ C = 10,957 \\ D = 6,452 } $ $ \boxed{ F = 1,400 \\ G = 261 \\ H = -3.5\% \\ J = 10,500 } $	(	ceded UEP) <sub>16</sub>	=	2,100	<== from	Page <b>20.10</b>	Balance Shee	t
And finally, using the <b>quota-share percentage</b> to GROSS UP this net value, we obtain: $\begin{aligned} (\text{gross UEP})_{17} &= (\text{net UEP})_{17} & 40\% \\ & \text{J} &= 4,200 & 40\% \\ & \text{J} &= 10,500 \end{aligned}$ hally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $\underbrace{(\text{net IBNR})_{17 & \text{prior}} = (\text{net APV})_{17 & \text{prior}} - (\text{net Case})_{17 & \text{prior}} \\ & \text{where} \\ (\text{net APV})_{17 & \text{prior}} &= 4,864 & <== \text{from Step 3b} \\ (\text{net Case})_{17 & \text{prior}} &= 3,000 & <== \text{from Runoff Exhibit ( 2017 UCAE for 2017 & prior)} \\ & \text{therefore} \\ & \text{K} &= 4,864 & - 3,000 \\ & = 1,864 \end{aligned}$	The result	is:						
$(\text{gross UEP})_{17} = (\text{net UEP})_{17} / 40\%$ $J = 4,200 / 40\%$ $J = 10,500$ hally): K is (net IBNR)_{17,& prior} and the standard formula is IBNR = (Total Liabilities) - Case $(\text{net IBNR})_{17,& prior} = (\text{net APV})_{17,& prior} - (\text{net Case})_{17,& prior}$ where $(\text{net APV})_{17,& prior} = 4,864  <== \text{from Step 3b}$ $(\text{net Case})_{17,& prior} = 4,864  <== \text{from Runoff Exhibit (2017, UCAE for 2017,& prior)}$ therefore $K = 4,864 - 3,000$ $= 1,864$ tion Summary: $\boxed{A = 6,992}$ $B = 11,857$ $C = 10,957$ $D = 6,452$ $\boxed{F = 1,400}$ $\boxed{G = 261}$ $H = -3.5\%$		(net UEP) <sub>17</sub>	=	4,200				
$J = \frac{4,200}{10,500} / 40\%$ $J = \frac{10,500}{10,500}$ hally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $\frac{(net IBNR)_{17 & prior}}{where} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 4,864  <== from Step 3b$ $(net Case)_{17 & prior} = 3,000  <== from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore $K = 4,864 - 3,000$ $= 1,864$ tion Summary: $\frac{A = 6,992}{B = 11,857}$ $\frac{F = 1,400}{G = 261}$ $H = -3.5\%$ $J = 10,500$	And finally	, using the <mark>qu</mark>	iota-share p	percentage to	GROSS UP	this net value	e, we obtain:	
J = $10,500$ hally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $\boxed{(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}}$ where $(net APV)_{17 & prior} = 4,864  <== from Step 3b$ (net Case)_{17 & prior} = 3,000 <== from Runoff Exhibit (2017 UCAE for 2017 & prior) therefore K = 4,864 - 3,000 $= 1,864$ tion Summary: $\boxed{A = 6,992}$ $B = 11,857$ $C = 10,957$ $D = 6,452$ $\boxed{F = 1,400}$ $G = 261$ $H = -3.5\%$ $J = 10,500$		(	=	(net UEP) <sub>17</sub>	/	40%		
hally):       K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $(net IBNR)_{17 & prior}$ = $(net APV)_{17 & prior}$ - $(net Case)_{17 & prior}$ where       (net APV)_{17 & prior}       = $4,864$ <== from Step 3b		(gross UEP) <sub>17</sub>						
$\frac{(\text{net IBNR})_{17 \& \text{ prior}} = (\text{net APV})_{17 \& \text{ prior}} - (\text{net Case})_{17 \& \text{ prior}}}{(\text{net Case})_{17 \& \text{ prior}}} = 4,864 <== from Step 3b (net Case)_{17 \& \text{ prior}} = 3,000 <== from Runoff Exhibit ( 2017 UCAE for 2017 \& prior) therefore K = 4,864 - 3,000 = 1,864 tion Summary:\frac{A = 6,992}{B = 11,857} = 1,400 G = 261 H = -3.5\% J = 10,500$				4,200	1	40%		
where $(net APV)_{17 \& prior}$ =       4,864       <== from Step 3b $(net Case)_{17 \& prior}$ =       3,000       <== from Runoff Exhibit ( 2017 UCAE for 2017 & prior)         therefore       K       =       4,864       -       3,000         therefore       K       =       4,864       -       3,000         tion Summary:       A       =       6,992       F       =       1,400         G       =       261       H       =       -3.5%         D       =       6,452       J       =       10,500		J	=		/	40%		
$\begin{array}{rcrcrc} (\text{net } APV)_{17 \ \& \ prior} & = & 4,864 & <== \ from \ Step \ 3b \\ (\text{net } Case)_{17 \ \& \ prior} & = & 3,000 & <== \ from \ Runoff \ Exhibit \ ( \ \underline{2017} \ UCAE \ for \ \underline{2017 \ \& \ prior} \\ \hline therefore \\ & & & & \\ \hline K & = & 4,864 & - & 3,000 \\ & & & & & \\ \hline & & & & \\ \hline & & & & \\ \hline & & & &$	ly): K is (net IB	]	= =	10,500			) - Case	
$\begin{array}{rcrcrc} (\text{net } APV)_{17 \ \& \ prior} & = & 4,864 & <== \ from \ Step \ 3b \\ (\text{net } Case)_{17 \ \& \ prior} & = & 3,000 & <== \ from \ Runoff \ Exhibit \ ( \ \underline{2017} \ UCAE \ for \ \underline{2017 \ \& \ prior} \\ \hline therefore \\ & & & & \\ \hline K & = & 4,864 & - & 3,000 \\ & & & & & \\ \hline & & & & \\ \hline & & & & \\ \hline & & & &$		J J NR) <sub>17 &amp; prior</sub> an	= = id the stand	10,500 ard formula is	IBNR = (To	tal Liabilities		& prior
$(\text{net Case})_{17 \& \text{prior}} = 3,000 <== \text{from Runoff Exhibit (} 2017 UCAE \text{ for } 2017 \& \text{prior} \\ \text{therefore} \\ K = 4,864 - 3,000 \\ = 1,864 \\ \text{tion Summary:} \\ \hline \begin{array}{c} A = 6,992 \\ B = 11,857 \\ C = 10,957 \\ D = 6,452 \\ \end{array} \qquad \begin{array}{c} F = 1,400 \\ G = 261 \\ H = -3.5\% \\ J = 10,500 \\ \end{array}$	(net IBNR)	J J NR) <sub>17 &amp; prior</sub> an	= = id the stand	10,500 ard formula is	IBNR = (To	tal Liabilities		& prior
$(\text{net Case})_{17 \& \text{ prior}} = 3,000 <== \text{from Runoff Exhibit (} 2017 UCAE \text{ for } 2017 \& \text{ prior} \\ \text{therefore} \\ K = 4,864 - 3,000 \\ = 1,864 \\ \text{tion Summary:} \\ \hline \begin{array}{c} A = 6,992 \\ B = 11,857 \\ C = 10,957 \\ D = 6,452 \\ \end{array} \qquad \begin{array}{c} F = 1,400 \\ G = 261 \\ H = -3.5\% \\ J = 10,500 \\ \end{array}$	(net IBNR)	J J NR) <sub>17 &amp; prior</sub> an	= = id the stand	10,500 ard formula is	IBNR = (To	tal Liabilities		& prior
K       = $4,864$ - $3,000$ = $1,864$ tion Summary:         A       = $6,992$ B       = $11,857$ C       = $10,957$ D       = $6,452$	(net IBNR) where	J J NR) <sub>17 &amp; prior</sub> an	= = ud the stand =	10,500 lard formula is (net APV) <sub>17 8</sub>	IBNR = (Tc	ital Liabilities		& prior
= 1,864 tion Summary: A = 6,992 $B = 11,857$ $G = 261$ $H = -3.5%$ $D = 6,452$ $J = 10,500$	(net IBNR) where (net APV) <sub>1</sub>	J J NR) <sub>17 &amp; prior</sub> an 17 & prior	= = nd the stand = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864	IBNR = (To prior <== fron	tal Liabilities	(net Case) <sub>17</sub>	<u> </u>
= 1,864 tion Summary: A = 6,992 $B = 11,857$ $G = 261$ $H = -3.5%$ $D = 6,452$ $J = 10,500$	(net IBNR) where (net APV) <sub>1</sub> (net Case)	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior I7 & prior	= = nd the stand = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864	IBNR = (To prior <== fron	tal Liabilities	(net Case) <sub>17</sub>	<u> </u>
Image: Second symplet with the symplet with t	(net IBNR) where (net APV) <sub>1</sub> (net Case)	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior 17 & prior	= e d the stand = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000	IBNR = (To prior <== fron	- - - - - - - - - - - - - - - - - - -	(net Case) <sub>17</sub>	<u> </u>
A       =       6,992       F       =       1,400         B       =       11,857       G       =       261         C       =       10,957       H       =       -3.5%         D       =       6,452       J       =       10,500	(net IBNR) where (net APV) <sub>1</sub> (net Case)	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior 17 & prior	= = d the stand = = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To prior <== fron	- - - - - - - - - - - - - - - - - - -	(net Case) <sub>17</sub>	<u> </u>
B     =     11,857     G     =     261       C     =     10,957     H     =     -3.5%       D     =     6,452     J     =     10,500	(net IBNR) where (net APV) <sub>1</sub> (net Case)	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior 17 & prior	= = d the stand = = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To prior <== fron	- - - - - - - - - - - - - - - - - - -	(net Case) <sub>17</sub>	<u> </u>
C         =         10,957         H         =         -3.5%           D         =         6,452         J         =         10,500	(net IBNR) where (net APV) <sub>1</sub> (net Case) <sub>?</sub> therefore	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior 17 & prior	= = d the stand = = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To prior <== fron	- - - - - - - - - - - - - - - - - - -	(net Case) <sub>17</sub>	<u> </u>
D = 6,452 J = 10,500	(net IBNR) where (net APV) <sub>1</sub> (net Case) <sub>3</sub> therefore	J J NR) <sub>17 &amp; prior</sub> an <u>17 &amp; prior</u> 7 & prior 17 & prior K	= = d the stand = = = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To prior <== from -	step 3b Runoff Exhib	(net Case) <sub>17</sub> bit ( <u>2017</u> UCA	<u> </u>
	(net IBNR) where (net APV) <sub>1</sub> (net Case) therefore	J J NR) <sub>17 &amp; prior</sub> an 17 & prior 7 & prior 17 & prior K	= = d the stand = = = = =	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To a prior <== from <== from - F G	step 3b Runoff Exhib 3,000	(net Case) <sub>17</sub> bit ( <u>2017</u> UCA	<u> </u>
E = 4,504 K = 1,864	(net IBNR) where (net APV) <sub>1</sub> (net Case) <sub>2</sub> therefore	J J NR) <sub>17 &amp; prior</sub> an 17 & prior 7 & prior 17 & prior K K	= = d the stand = = = = 6,992 11,857 10,957	10,500 lard formula is (net APV) <sub>17 8</sub> 4,864 3,000 4,864	IBNR = (To prior <== from <== from - F G H	stal Liabilities - • Step 3b Runoff Exhib 3,000 = = = =	(net Case) <sub>17</sub> bit ( <u>2017</u> UCA <u>1,400</u> <u>261</u> -3.5%	<u> </u>

Paper: Problem: Problem Type:	CCIR.ARinstr calculate (A,B,C 2018.Fall #16	,D,E,F,G,H,J,K) - th	ere is no "I"	(Alpha	bet City (N	1odel 18.F Q16))	06 a-Question
Balance	Page 20.10 Ass	et		2017	2016		
Sheet	recoverable fro			2017	2010		
Uncer	UEP			n/a	2,200	<== ceded values	5
	UCAE			A	2,650	<== ceded values	
		its including cash		38,400	40,900		
	Page 20.20 Liab	oilities & Equity		2017	2016		
	UEP	• •		J	4,400	<== gross values	
	UCAE			В	5,300	<== gross values	
	-						
Income	Page 20.30 Stat	tement of Income		2017	2016		
Statement	NWP			22,000	20,800		
	NEP			20,900	n/a		
	GROSS claims &	adjustment exper	ises	С	n/a		
	REINSURER'S SH	HARE of claims & a	dj exps	D	n/a		
	NET claims & ac	djustment expense	S	E	n/a		
	NET investment	t income		2,600	n/a		
	1					i	
Runoff		Clms & Adj Exps F	lunoff			AY 2017	
СҮ	Discounted			AY 2016	AY 2017	& prior	
2016		of year		1,700			
		of year		1,800			
2017		ing year		F	n/a	n/a	
		of year		1,200	n/a	2,400	
		of year ome from UCAE & I		1,300	n/a	K	
		ess/deficiency	BINK	G n/a			
		ess/deficiency		Н			
		cost deficiency		11			
Bond	rating c	class book val.	mkt. val.	duration	yield		
Portfolio	govt HTN				1.4%		
	AAA HTN				2.0%		
	A HTN				5.0%		
Triangle	GROSS paid loss	s (cumulative)		GROSS unp	aid loss ( <u>un</u> o	discounted)	
Data	AY	12 24	-	AY	12	24	
	2016	1,700 3,300		2016	n/a	4,400	
	2017	1,200		2017	6,100		
<b>.</b> .					,		
Payment		30%	MfADs	MfAD (clain	ns):	20.00%	
Pattern	-	30%		MfAD (re):		14.00%	
(incremental)	year 3 4	40%		MfAD (inv):		1.50%	
				remsuran	ce quota-sh	are RETENTION ==	=> <b>50%</b>

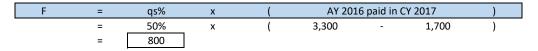
Step 1:	calculate the	discount ra	ate as a weigl	hted avera	ge of the yield	s in the bon	d portfolio			
	weight *	yield		* weight =	(book value) >	duration				
	18,720	. 1.4%		<sup>o</sup>						
	120,000	2.0%								
	20,000	5.0%								
		2.31%	<== discour	nt rate						
Step 2a:	calculate the	gross DV fo	or AV 2017 an	d AV 2016	( <u>qross</u> of quo	ta-chara rai	nsurance) at		<u>2.31%</u>	
Step 2a.		<u>gross</u> r v ro	// AT 2017 at	IU AT 2010	( <u>91033</u> 0) 900	lu-shure rei	iisuiuiice) at		2.31/0	
	AY 2017:	unpaid	=	6,100	(at 12 montl	ns)				
		$PV_{17}$	=	30%	/	70%	х	6,100	/	1.0231 ^ 0.5
			+	40%	/	70%	х	6,100	/	1.0231 ^ 1.5
			=	2,585	+	3,368				
			=	<u>5,953</u>						
	AY 2016:	unpaid	=	4,400	(at 24 montl	ns)				
		PV <sub>16</sub>	=	40%	/	40%	x	4,400	/	1.0231 ^ 0.5
		10	=	4,350	,			.,	,	
				<u>.,</u>						
	==>	gross	PV for both A	AYs at:	2.31%	is	10,303			
Step 2b:	calculate the	gross PV fo	or AV 2017 an	d AV 2016	( <u>qross</u> of quo	ta-share rei	nsurance) at		<u>0.81%</u>	
5100 20.		<u>gr033</u> 1 v ic			( <u>91033</u> 0) 900	la-share rei	insurance, at		0.01/0	
	==>	gross	PV for both A	AYs at:	0.81%	is	10,430	(similar cal	culation to	Step 1)
		0								• •
					/					-
Step 3a:	gross APV	=	10,430	+	20.00%	х	10,303	=	12,490	
Step 3b:	net APV	=	10,430	x	50%					
		+	10,303	x	50%	x	20.00%			
		+	10,303	х	50%	х	14.00%			
		=	6,966							
Step 3c:	ceded APV	=	12,490	-	6,966	=	5,524			

A & B are ve	ery easy: ( <u>B</u>	is the	net claims <b>liability</b> , <u>A</u> i	s the reinsuran	ce recoverable <b>c</b>	asset)		
	A B	= =	5,524 12,490	UCAE recov gross UCAE	verable from reil Eliability		(Step 3c) (Step 3a)	
C, D & E are	more confusin	g:						
	С	=	the GROSS "income"	due to GROSS	claims in 2017 <i>(t</i>	think of it d	as <b>negative</b>	e income)
		=	(2017 gross UCAE)	-	(2016 gross UC	CAE)	+	(gross paid in 2017) *
		=	В	-	given info		+	from paid triangle
		=	12,490	-	5,300		+	2,800
		=	9,990					
	* (gross paid i	n 2017)						
		=	2016@24 -	2016 @ 12	+ 2	017 @ 12		
		=	3,300 -	1,700	+	1,200		
		=	2,800					
	D	= = = =	the CEDED "income" (2017 ceded UCAE) A 5,524 4,274	due to CEDED - - - -	claims in 2017 (t (2016 ceded U <i>given info</i> 2,650		coverable ) + + +	(ceded paid in 2017) ** see below 1,400
	* (ceded paid )	in 2017)						
		=	gross paid in 2017	х	50%			
		=	2,800	х	50%			
		=	1,400					
	E	=	net "income" due to	claims in 2017	(this is also <b>neg</b>	<b>ative</b> inco	ome)	
		=	C -	D				
		=	9,990 -	4,274				
		=	5,716					

F is easy: if you know that the year labels in the left column of the table represent Calendar Years

and the year labels in the top row represent Accident Years

Use the paid loss triangle and the quota-share percentage



G & H are related:

related: <u>H</u> is the excess (deficiency) ratio and <u>G</u> is the investment income in the excess (deficiency) formula

You might like to review the practice template for the excess (defiency) ratio before proceeding! In any case, we first need to calculate G. Note that UCAE + IBNR are directly from the **Runoff exhibit** in the given info.

G	=	(investment	yield) *	х	avg [ (UCAE	+IBNR) <sub>beg of 1</sub>	, (UCAE + IBN	IR) <sub>end of 17</sub> ]
	=	6.78%		х	avg [	3,500	,	2,500
	=	203						
investment	yield							
	=	2	х	NII				
		/ [(invested a	ssets) <sub>beg of 17</sub>	+ (invested	assets) <sub>end of 1</sub>	7 - NII ]		
	=	2	х	2,600				
		/ [	38,400	+	40,900	-	2,600	]
	=	6.78%						
<u>III</u> or <u>net inv</u>	estment	income comes	from the <b>Inc</b>	ome Stater	nent			
nvested asse	ts come	from the Balan	ce Sheet					

= [ (UCAE + IBNR)<sub>AY16 @ 12</sub> - (UCAE + IBNR)<sub>AY16 @ 24</sub> - (net Pd)<sub>12-24</sub> + G ] / (UCAE + IBNR)AY16 @ 12

Now:

Н

(UCAE + IBNR) <sub>AY16 @ 12</sub>	=	1,700	+	1,800	=	3,500
(UCAE + IBNR) <sub>AY16 @ 24</sub>	=	1,200	+	1,300	=	2,500
(net Pd) <sub>12-24</sub>	=	F			=	800

Therefore:

н

11.5% <== Excess (Deficiency) Ratio

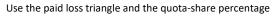
	EP	=	WP	-	chg(UEP)	]	
Apply this	s to our situatio	n to obtain:	:				
	NEP <sub>17</sub>	=	NWP <sub>17</sub>	-	[ (net UEP)	17 - (net UEP)10	<sub>5</sub> ]
	20,900	=	22,000	-	[ (net UEP)	<sub>17</sub> - ( (gross UE	P) <sub>16</sub> - (ceded UEP
Ok, this is	getting messy	so I'm going	g to let you do	the algeb	ra. Substitute	these values	above:
	(gross UEP) <sub>16</sub>	=	4,400	<== from	Page 20.20	Balance Shee	t
	(ceded UEP) <sub>16</sub>	=	2,200	<== from	Page <b>20.10</b>	Balance Shee	t
The result	t is:						
	(net UEP) <sub>17</sub>	=	3,300				
And finall	y, using the <mark>qu</mark>	ota-share p	ercentage to	GROSS UP	this net value	e, we obtain:	
	(gross UEP) <sub>17</sub>	=	(net UEP) <sub>17</sub>	/	50%		
	J	=	3,300	/	50%		
		_	6 600				
	1	=	6,600				
nally): K is (net I				IBNR = (Tc	tal Liabilities	) - Case	
nally): K is (net IE	BNR) <sub>17 &amp; prior</sub> and				tal Liabilities	) - Case (net Case) <sub>17 8</sub>	& prior
	BNR) <sub>17 &amp; prior</sub> and	d the standa	ard formula is				& prior
(net IBNR) where (net APV)	BNR) <sub>17 &amp; prior</sub> and ) <sub>17 &amp; prior</sub> 17 & prior	d the standa	ard formula is	k prior <== from	- Step 3b	(net Case) <sub>17 ;</sub>	
(net IBNR) where	BNR) <sub>17 &amp; prior</sub> and ) <sub>17 &amp; prior</sub> 17 & prior	d the standa =	ard formula is (net APV) <sub>17 8</sub>	k prior <== from	- Step 3b	(net Case) <sub>17 ;</sub>	<sup>&amp; prior</sup> E for <u>2017 &amp; pric</u>
(net IBNR) where (net APV)	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub>	d the standa = =	ard formula is (net APV) <sub>17 8</sub> 6,966	k prior <== from	- Step 3b	(net Case) <sub>17 ;</sub>	
(net IBNR) where (net APV) (net Case)	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub>	d the standa = =	ard formula is (net APV) <sub>17 8</sub> 6,966	k prior <== from	- Step 3b	(net Case) <sub>17 ;</sub>	
(net IBNR) where (net APV) (net Case)	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior ) <sub>17 &amp; prior</sub>	d the standa = = =	6,966 2,400	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 ;</sub>	
(net IBNR) where (net APV) (net Case)	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior ) <sub>17 &amp; prior</sub>	d the standa = = = =	6,966 6,966	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 ;</sub>	
(net IBNR) where (net APV) (net Case) therefore	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior ) <sub>17 &amp; prior</sub>	d the standa = = = =	6,966 6,966	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 ;</sub>	
(net IBNR) where (net APV) (net Case) therefore tion Summary: A B	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior 17 & prior e K	d the standa = = = = = 5,524 12,490	6,966 6,966	<pre>c prior &lt;== from &lt;== from - G</pre>	- Step 3b Runoff Exhib 2,400	(net Case) <sub>17 t</sub> bit ( <u>2017</u> UCA <u>800</u> 203	
(net IBNR) where (net APV) (net Case) therefore tion Summary: A B C	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior 17 & prior e K	d the standa = = = = = 5,524 12,490 9,990	6,966 6,966	<pre>     prior     &lt;== from     &lt;== from     </pre> <pre>         F         G         H </pre>	- Step 3b Runoff Exhib 2,400 = = =	(net Case) <sub>17 i</sub>	
(net IBNR) where (net APV) (net Case) therefore tion Summary: A B	BNR) <sub>17 &amp; prior</sub> and ) <u>17 &amp; prior</u> 17 & prior 17 & prior 2 K K	d the standa = = = = = 5,524 12,490	6,966 6,966	<pre>c prior &lt;== from &lt;== from - G</pre>	- Step 3b Runoff Exhib 2,400 = =	(net Case) <sub>17 t</sub> bit ( <u>2017</u> UCA <u>800</u> 203	

Paper: Problem: Problem Type:	CCIR.ARinstr calculate (A,B,C,D,E,F,G,H,J,K) - there is no "I" 2018.Fall #16	(Alphabet City (Model 18.F Q16)) 07 a-Qu	estion
Balance	Page 20.10 Asset	2017 2016	
Sheet	recoverable from reinsurers:	2017 2018	
Sheet	UEP	n/a 1,520 <== ceded values	
	UCAE	A 1,920 <== ceded values	
	total investments including cash	29,000 21,300	
	Page 20.20 Liabilities & Equity	2017 2016	
	UEP	J 3,800 <== gross values	
	UCAE	B 4,800 <== gross values	
Income	Page 20.30 Statement of Income	2017 2016	
Statement	NWP	17,000 16,100	
	NEP	17,600 n/a	
	GROSS claims & adjustment expenses	C n/a	
	REINSURER'S SHARE of claims & adj exps	D n/a	
	NET claims & adjustment expenses	E n/a	
	NET investment income	2,000 n/a	
		· · · · · · · · · · · · · · · · · · ·	
Runoff	Page 60.41 Net Clms & Adj Exps Runoff	AY 2017	
<b>CY</b>	Discounted	AY 2016 AY 2017 & prior	
2016		1,100	
2017	IBNR end of year	1,800	
2017	5,	F n/a n/a	
	UCAE end of year	900 n/a 2,500	
	IBNR end of year investment income from UCAE & IBNR	1,300 n/a K G	
	Amount: excess/deficiency	n/a	
	Ratio: excess/deficiency	H	
Bond	rating class book val. mkt. val.	duration yield	
Portfolio	govt HTM 15,000 13,950		
	AAA HTM 10,000 11,600	10.0 2.2%	
	A HTM 2,000 2,160	1.0 6.6%	
Triangle	GROSS paid loss (cumulative)	GROSS unpaid loss (undiscounted)	
Data	AY 12 24	AY 12 24	
	2016 1,300 3,100	2016 n/a 3,800	
	2017 1,300	2017 3,700	
Deciment			
Payment	year 1 10% MfADs	MfAD (claims): 15.00%	
Pattern (incremental)	year 2 10% year 3 80%	MfAD (re): 9.00% MfAD (inv): 0.25%	
(incrementar)	year 5 0070		0%

Step 1:	calculate the	discount ra	ate as a weigl	hted avera	ge of the yields	s in the bon	d portfolio			
	weight *	yield	_	* weight =	(book value) >	duration				
	18,900	1.3%								
	100,000	2.2%								
	2,000	6.6%								
		2.13%	<== discour	nt rate						
Step 2a:	calculate the	gross PV fo	or AY 2017 an	d AY 2016	( <u>gross</u> of quo	ta-share rei	<i>nsurance)</i> at		<u>2.13%</u>	
	AY 2017:	unpaid	=	3,700	(at 12 montl	ns)				
		PV <sub>17</sub>	=	10%	/	90%	х	3,700	/	1.0213 ^ 0.5
			+	80%	/	90%	х	3,700	/	1.0213 ^ 1.5
			=	407	+	3,187				
			=	3,593						
	AY 2016:	unpaid	=	3,800	(at 24 montl	ns)				
		PV <sub>16</sub>	=	80%	/	80%	x	3,800	/	1.0213 ^ 0.5
		V 16			/	0070	^	3,800	/	1.0215 0.5
			=	<u>3,760</u>						
			D) (for both (		2.420/	•-	7 354			
	==>	gross	PV for both A	AYS at:	2.13%	is	7,354			
Step 2b:	calculate the	<u>gross</u> PV fo	or AY 2017 an	id AY 2016	( <u>gross</u> of quo	ta-share rei	<i>nsurance)</i> at		<u>1.88%</u>	
	==>	gross	PV for both A	AYs at:	1.88%	is	7,370	(similar ca	lculation to	Step 1)
Step 3a:	gross APV	=	7,370	+	15.00%	x	7,354	=	8,473	
Step Sa.	gross APV	-	7,370	Ŧ	15.00%	X	7,554	-	0,475	
Step 3b:	net APV	=	7,370	x	60%					
		+	7,354	х	60%	х	15.00%			
		+	7,354	х	40%	х	9.00%			
		=	5,349							
Step 3c:	ceded APV	=	8,473	-	5,349	=	3,125			
			-,		-,		-,			

A & B are ver	y easy: ( <u>B</u> is	s the net c	laims <b>liability</b>	r, <u>A</u> is th	e reinsurand	e recoverabl	e <b>asset</b> )		
	A B	=	3,125 8,473		UCAE recov gross UCAE	erable from liability		(Step 3c) (Step 3a)	
C, D & E are r	more confusing:								
	С		e GROSS "inco 017 gross UC/ B 8,473 6,773		e to GROSS c - - -	laims in 2013 (2016 gross given info 4,800		as <b>negative</b> + + +	e income) (gross paid in 2017) * from paid triangle 3,100
3	* (gross paid in 2		016 @ 24 3,100 <b>3,100</b>	-	2016 @ 12 1,300	+ +	2017 @ 12 1,300		
	D		e CEDED "inco 017 ceded UC A 3,125 2,445		e to CEDED c - - -	laims in 2017 (2016 cedec <i>given info</i> 1,920		coverable ) + + +	(ceded paid in 2017) ** see below 1,240
2	* (ceded paid in 2		oss paid in 201 3,100 <b>1,240</b>	7	x x	40% 40%			
	E	= ne = = =	et "income" de C 6,773 4,329	ue to clai - -	ms in 2017 ( D 2,445	'this is also <b>n</b>	<b>egative</b> inco	ome)	

F is easy: if you know that the year labels in the left column of the table represent Calendar Years and the year labels in the top row represent Accident Years





G & H are related:

related: <u>H</u> is the excess (deficiency) ratio and <u>G</u> is the investment income in the excess (deficiency) formula

You might like to review the practice template for the excess (defiency) ratio before proceding! In any case, we first need to calculate G. Note that UCAE + IBNR are directly from the **Runoff exhibit** in the given info.

G	=	(investment	yield) *	х	avg [ (UCAE-	+IBNR) <sub>beg of 15</sub>	7, <b>(</b> UCAE + IBN	IR) <sub>end of 17</sub> ]
	=	8.28%		х	avg [	2,900	,	2,200
	=	211						
* investment	yield							
	=	2	х	NII				
	/	[ (invested a	ssets) <sub>beg of 17</sub>	+ (invested	assets) <sub>end of 1</sub>	<sub>7</sub> - NII ]		
	=	2	х	2,000				
	/	[	29,000	+	21,300	-	2,000	]
	=	8.28%						
NII or net inve	estment ir	ncome comes	from the <b>Inc</b>	ome Stater	nent			
nvested asset	s come fi	om the Balan	ce Sheet					

= [ (UCAE + IBNR)<sub>AY16 @ 12</sub> - (UCAE + IBNR)<sub>AY16 @ 24</sub> - (net Pd)<sub>12-24</sub> + G ] / (UCAE + IBNR)AY16 @ 12

Now:

Н

(UCAE + IBNR) <sub>AY16 @ 12</sub>	=	1,100	+	1,800	=	2,900
(UCAE + IBNR) <sub>AY16 @ 24</sub>	=	900	+	1,300	=	2,200
(net Pd) <sub>12-24</sub>	=	F			=	1,080

Therefore:

н

=

-5.8% <== Excess (Deficiency) Ratio

$\boxed{P = WP - chg(UEP)}$ Apply this to our situation to obtain: $NEP_{17} = NWP_{17} - [(net UEP)_{17} - (net UEP)_{16}]$ $17,600 = 17,000 - [(net UEP)_{17} - ((gross UEP)_{16} - (ceded UEP)_{17}]$ Ok, this is getting messys to I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,800 <= from Page 20.20 Balance Sheet (ceded UEP)_{15} = 1,520 <= from Page 20.20 Balance Sheet (ceded UEP)_{17} = 1,680$ And finally, using the <b>quota-share percentage</b> to GROSS UP this net value, we obtain: $(gross UEP)_{17} = (net UEP)_{17} / 60\%$ $J = 1,680 / 60\%$ $J = 1,680 / 60\%$ $J = 2,800 / 60\%$ (finally): K is (net IBNR)_{17.6 prior} = (net APV)_{17.6 prior} - (net Case)_{17.6 prior} $(net Case)_{17.6 prior} = 5,349 <= from Step 3b$ $(net Case)_{17.6 prior} = 2,500 <== from Step 3b$ $(net Case)_{17.6 prior} = 2,549 - 2,500$ $\boxed{Exp(12,249)} = 2,249$								
$NEP_{17} = NWP_{17} - [(net UEP)_{17} - (net UEP)_{16}]$ $17,600 = 17,000 - [(net UEP)_{17} - ((gross UEP)_{16} - (ceded UEP)_{17}]$ $Qrows UEP)_{16} = 3,800 < = from Page 20.20 Balance Sheet$ $(ceded UEP)_{16} = 1,520 < = from Page 20.20 Balance Sheet$ $(ceded UEP)_{16} = 1,520 < = from Page 20.20 Balance Sheet$ $(ceded UEP)_{17} = 1,680$ And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $(gross UEP)_{17} = (net UEP)_{17} / 60\%$ $J = 1,680 / 60\%$ $J = 1,2800 / 60\%$ (finally): K is (net IBNR)_{17.8 prior} and the standard formula is IBNR = (Total Liabilities) - Case $(net APV)_{17.8 prior} = 5,349 < = from Step 3b$ $(net Case)_{17.8 prior} = 2,500 < = from Runoff Exhibit (2017 UCAE for 2017.8 prior therefore$ $K = 5,349 - 2,500$ $= 2,849$ $Cutton Summary:$		EP	=	WP	-	chg(UEP)	]	
$17,600 = 17,000 \cdot [(net UEP)_{17} - ((gross UEP)_{16} - (ceded UEP)_{16}]$ Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,800 <= from Page 20.20 Balance Sheet (ceded UEP)_{16} = 1,520 <= from Page 20.10 Balance Sheet (ceded UEP)_{17} = 1,680 And finally, using the quota-share percentage to GROSS UP this net value, we obtain: (gross UEP)_{17} = (net UEP)_{17} / 60\% J = 1,680 / 60\% J = 1,680 / 60\% (finally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case(net APV)_{17 & prior} = 0, (net APV)_{17 & prior} - (net Case)_{17 & prior} where(net APV)_{17 & prior} = 2,500 <= from Runoff Exhibit (2017) UCAE for 2017 & prior therefore K = 5,349 - 2,500 = 2,849 Divition Summary:\frac{A = 3,125}{B = 0,773} \frac{F = 1,080}{G = 211} \frac{F = 1,080}{G = 211}$	Apply thi	s to our situatio	n to obtain	:				
Ok, this is getting messy so I'm going to let you do the algebra. Substitute these values above: $(gross UEP)_{16} = 3,800 < == from Page 20.20 Balance Sheet$		NEP <sub>17</sub>	=	NWP <sub>17</sub>	-	[ (net UEP) <sub>1</sub>	<sub>7</sub> - (net UEP) <sub>16</sub> ]	
$(\text{gross UEP})_{16} = 3,800  \langle == \text{from Page 20.20 Balance Sheet} \\ (\text{ceded UEP})_{16} = 1,520  \langle == \text{from Page 20.10 Balance Sheet} \end{cases}$ The result is: $(\text{net UEP})_{17} = 1,680$ And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $(\text{gross UEP})_{17} = (\text{net UEP})_{17} / 60\%$ $J = 1,680 / 60\%$ $J = 2,800$ (finally): K is (net IBNR)_{17.8 \text{ prior}} and the standard formula is IBNR = (Total Liabilities) - Case $(\text{net IBNR})_{17.8 \text{ prior}} = (\text{net APV})_{17.8 \text{ prior}} - (\text{net Case})_{17.8 \text{ prior}}$ where $(\text{net APV})_{17.8 \text{ prior}} = 5,349  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle == \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{net Case})_{17.8 \text{ prior}} = 2,500  \langle = \text{from Step 3b} \\ (\text{from Step 3b} = 2,500  \langle = \text{from Step 3b} \\ (\text{from Step 3b} = 2,500  \langle = fr$		17,600	=	17,000	-	[ (net UEP) <sub>1</sub>	7 - ( (gross UEP) <sub>16</sub> - (ced	led UEP) <sub>1</sub>
$(\text{ceded UEP})_{16} = 1,520  <== \text{from Page 20.10 Balance Sheet}$ The result is: $(\text{net UEP})_{17} = 1,680$ And finally, using the <b>quota-share percentage</b> to GROSS UP this net value, we obtain: $(\text{gross UEP})_{17} = (\text{net UEP})_{17} / 60\%$ $J = 1,680 / 60\%$ $J = 2,800$ (finally): K is (net IBNR)_{27.8 \text{ prior}} and the standard formula is IBNR = (Total Liabilities) - Case $(\text{net IBNR})_{17.8 \text{ prior}} = (\text{net APV})_{17.8 \text{ prior}} - (\text{net Case})_{17.8 \text{ prior}}$ $where$ $(\text{net APV})_{17.8 \text{ prior}} = 5,349  <== \text{from Step 3b}$ $(\text{net Case})_{17.8 \text{ prior}} = 2,500  <== \text{from Runoff Exhibit (2017 UCAE for 2017 & prior)}$ $therefore$ $K = 5,349 - 2,500$ $current Case = 5,349 - 5,350$ $current Case = 5,349$ $current Case = 5,349 - 5,350$ $current Case = 5,349$	Ok, this is	s getting messy s	so I'm going	g to let you do	the algebr	a. Substitute	these values above:	
The result is:		(gross UEP) <sub>16</sub>	=	3,800	<== from	Page 20.20	Balance Sheet	
$ (\text{net UEP})_{17} = 1,680 $ And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $ (\text{gross UEP})_{17} = (\text{net UEP})_{17} / 60\% \\ J = 1,680 / 60\% \\ J = 2,800 $ (finally): K is (net IBNR)_{17.8 prior} and the standard formula is IBNR = (Total Liabilities) - Case $ (\text{net APN})_{17.8 \text{ prior}} = (\text{net APV})_{17.8 \text{ prior}} - (\text{net Case})_{17.8 \text{ prior}} $ where $ (\text{net APV})_{17.8 \text{ prior}} = 5,349 < == \text{from Step 3b} (\text{net Case})_{17.8 \text{ prior}} = 2,500 < == \text{from Runoff Exhibit (2017) UCAE for 2017.8 prior} $ therefore K = 5,349 - 2,500 < == from Runoff Exhibit (2017) UCAE for 2017.8 prior  Delution Summary: $ \frac{A = 3,125}{B = 8,473} \qquad \qquad$		(ceded UEP) $_{16}$	=	1,520	<== from	Page <b>20.10</b>	Balance Sheet	
And finally, using the quota-share percentage to GROSS UP this net value, we obtain: $(gross UEP)_{17} = (net UEP)_{17} / 60\%$ $J = 1,680 / 60\%$ $J = 2,800$ (finally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case $(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 5,349 \iff from Step 3b$ $(net Case)_{17 & prior} = 2,500 \iff from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore K = 5,349 - 2,500 Solution Summary: $\frac{A = 3,125}{C = 6,773}$ $\frac{F = 1,080}{G = 211}$ $H = -5.8\%$ $J = 2,849$	The resul	t is:						
$(\text{gross UEP})_{17} = (\text{net UEP})_{17} / 60\%$ $J = \frac{1,680}{2,800} / 60\%$ $J = \frac{1,680}{2,800} / 60\%$ (finally): K is (net IBNR)_{17 & prior} and the standard formula is IBNR = (Total Liabilities) - Case $(\text{net IBNR})_{17 & prior} = (\text{net APV})_{17 & prior} - (\text{net Case})_{17 & prior}$ where $(\text{net Case})_{17 & prior} = 5,349 < == \text{from Step 3b}$ $(\text{net Case})_{17 & prior} = 2,500 < == \text{from Runoff Exhibit (2017 UCAE for 2017 & prior)}$ therefore $K = 5,349 - 2,500$ $= 2,849$ Duttion Summary: $(\text{A} = 3,125)$ $R = 8,473$ $C = 6,773$ $D = 2,445$ $(\text{Production Summary}) = 2,800$		(net UEP) <sub>17</sub>	=	1,680				
$\int = \frac{1,680}{2,800} / 60\%$ $\int = \frac{1,680}{2,800} / 60\%$ (finally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $\boxed{(net IBNR)_{17 & prior}} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 5,349 < == from Step 3b$ (net Case) <sub>17 &amp; prior</sub> = 2,500 <== from Runoff Exhibit (2017 UCAE for 2017 & prior) therefore $K = 5,349 - 2,500$ $= 2,849$ Solution Summary: $\boxed{A = 3,125}$ $\boxed{B = 8,473}$ $\boxed{C = 6,773}$ $\boxed{D = 2,445}$ $\boxed{F = 1,080}$	And final	ly, using the <b>qu</b> o	ota-share p	ercentage to	GROSS UP	this net value	, we obtain:	
$J = 2,800$ (finally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where $(net APV)_{17 & prior} = 5,349 \iff from Step 3b$ $(net Case)_{17 & prior} = 2,500 \iff from Runoff Exhibit (2017 UCAE for 2017 & prior)$ therefore $K = 5,349 - 2,500$ $= 2,849$ Solution Summary: $M = 3,125$ $B = 8,473$ $C = 6,773$ $D = 2,445$ $F = 1,080$ $G = 211$ $H = -5.8\%$ $J = 2,800$		(gross UEP) <sub>17</sub>	=	(net UEP) <sub>17</sub>	/	60%		
(finally): K is (net IBNR) <sub>17 &amp; prior</sub> and the standard formula is IBNR = (Total Liabilities) - Case $\frac{(net IBNR)_{17 & prior} = (net APV)_{17 & prior} - (net Case)_{17 & prior}$ where (net APV) <sub>17 &amp; prior</sub> = 5,349 <== from Step 3b (net Case)_{17 & prior} = 2,500 <== from Runoff Exhibit (2017 UCAE for 2017 & prior) therefore K = 5,349 - 2,500 = 2,849 Duttion Summary: $\frac{A = 3,125}{B = 8,473}$ $\frac{F = 1,080}{G = 211}$ $H = -5.8\%$ $J = 2,800$		J	=	1,680	/	60%		
$\begin{array}{rcrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$				=/= = =				
where $(net APV)_{17 \& prior}$ = $5,349$ <== from Step 3b $(net Case)_{17 \& prior}$ = $2,500$ <== from Runoff Exhibit ( 2017 UCAE for 2017 & prior         therefore         K       = $5,349$ - $2,500$ E (net Case)_{17 \& prior         UCAE for 2017 & prior         therefore         K       = $5,349$ - $2,500$ olution Summary:         A       = $3,125$ E       = $1,080$ B       = $8,473$ G       = $2,111$ H       = $-5.8\%$ J       = $2,800$	finally): K is (net l	BNR)and	the stand:		IBNR = (To	tal Liahilities)	- Case	
$\begin{array}{rcrcrc} (\text{net } APV)_{17 \&\text{prior}} &=& 5,349 & <== from  Step  3b \\ (\text{net } Case)_{17 \&\text{prior}} &=& 2,500 & <== from  Runoff  Exhibit  (  \underline{2017}  UCAE  for   \underline{2017 \& prior} \\ \hline \\ therefore \\ & & & & \\ \hline \\ & & & & \\ \hline \\ & & & & \\ \hline \\ & & & &$			l the standa	ard formula is		tal Liabilities)		
$(\text{net Case})_{17 \& \text{ prior}} = 2,500 <= \text{from Runoff Exhibit (} 2017 UCAE \text{ for } 2017 \& \text{ prior}$ $therefore$ $K = 5,349 - 2,500$ $= 2,849$ Dolution Summary: $\boxed{\begin{array}{c} A = 3,125 \\ B = 8,473 \\ C = 6,773 \\ D = 2,445 \end{array}} \qquad \boxed{\begin{array}{c} F = 1,080 \\ G = 211 \\ H = -5.8\% \\ J = 2,800 \end{array}}$				ard formula is				
therefore K = 5,349 - 2,500 $= 2,849$ Solution Summary: M = 3,125 $B = 8,473$ $G = 211$ $H = -5.8%$ $J = 2,445$ $J = 2,800$	(net IBNR	R) <sub>17 &amp; prior</sub>		ard formula is				
K = 5,349 - 2,500 $= 2,849$ Dolution Summary: $A = 3,125$ $B = 8,473$ $C = 6,773$ $D = 2,445$ $F = 1,080$ $G = 211$ $H = -5.8%$ $J = 2,800$	(net IBNR <i>where</i> (net APV)	() <sub>17 &amp; prior</sub>	=	ard formula is (net APV) <sub>17 8</sub>	k prior <== from	- Step 3b	(net Case) <sub>17 &amp; prior</sub>	
= 2,849 olution Summary: $A = 3,125$ $B = 8,473$ $C = 6,773$ $D = 2,445$ $F = 1,080$ $G = 211$ $H = -5.8%$ $J = 2,800$	(net IBNR <i>where</i> (net APV)	() <sub>17 &amp; prior</sub>	=	ard formula is (net APV) <sub>17 8</sub> 5,349	k prior <== from	- Step 3b	(net Case) <sub>17 &amp; prior</sub>	7 & prior
A       = $3,125$ F       = $1,080$ B       = $8,473$ G       = $211$ C       = $6,773$ H       = $-5.8\%$ D       = $2,445$ J       = $2,800$	(net IBNR where (net APV) (net Case	)17 & prior )17 & prior )17 & prior	=	ard formula is (net APV) <sub>17 8</sub> 5,349	k prior <== from	- Step 3b	(net Case) <sub>17 &amp; prior</sub>	7 & prior
A       =       3,125       F       =       1,080         B       =       8,473       G       =       211         C       =       6,773       H       =       -5.8%         D       =       2,445       J       =       2,800	(net IBNR where (net APV) (net Case	() <sub>17 &amp; prior</sub> ) )17 & prior () 17 & prior () 2 () 2 () 2 () 2 () 2 () 2 () 2 ()	= = =	(net APV) <sub>17 8</sub> 5,349 2,500	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 &amp; prior</sub>	7 & prior
B     =     8,473       C     =     6,773       D     =     2,445         G     =     211       H     =     -5.8%       J     =     2,800	(net IBNR where (net APV) (net Case	() <sub>17 &amp; prior</sub> ) )17 & prior () 17 & prior () 2 () 2 () 2 () 2 () 2 () 2 () 2 ()	=	5,349 5,349 5,349	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 &amp; prior</sub>	7 & prior
B     =     8,473       C     =     6,773       D     =     2,445         G     =     211       H     =     -5.8%       J     =     2,800	(net IBNR where (net APV) (net Case therefor	() <sub>17 &amp; prior</sub> ) )17 & prior () 17 & prior () 2 () 2 () 2 () 2 () 2 () 2 () 2 ()	=	5,349 5,349 5,349	k prior <== from	- Step 3b Runoff Exhib	(net Case) <sub>17 &amp; prior</sub>	7 & prior
D = 2,445 J = 2,800	(net IBNR where (net APV) (net Case <i>therefor</i>	R) <sub>17 &amp; prior</sub> ) <sub>17 &amp; prior</sub> ) <sub>17 &amp; prior</sub> R K	= = = =	5,349 5,349 5,349	<pre>&gt; prior &lt;== from &lt;== from -</pre>	- Step 3b Runoff Exhib 2,500	(net Case) <sub>17 &amp; prior</sub>	7 & prior
	(net IBNR where (net APV) (net Case <i>therefor</i>	R) <sub>17 &amp; prior</sub> )17 & prior )17 & prior )17 & prior (e) K	= = = = 3,125	5,349 5,349 5,349	<pre>&gt; prior &lt;== from &lt;== from -</pre>	- Step 3b Runoff Exhib 2,500 =	(net Case) <sub>17 &amp; prior</sub> it ( <u>2017</u> UCAE for <u>201</u> 1,080	7 & prior
E = 4,329 K = 2,849	(net IBNR where (net APV) (net Case therefor	<pre>{} 17 &amp; prior } 17 &amp; prior } 17 &amp; prior } 17 &amp; prior </pre>	= = = = 3,125 8,473 6,773	5,349 5,349 5,349	<pre>&gt; prior </pre> <== from  -  F  G  H	- <i>Step 3b</i> <i>Runoff Exhib</i> 2,500 = = =	(net Case) <sub>17 &amp; prior</sub> it ( <u>2017</u> UCAE for <u>201</u> it ( <u>2017</u> UCAE for <u>201</u> -5.8%	7 & prior

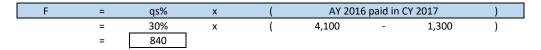
Paper: Problem: Problem Type	:	CCIR.ARins calculate ( 2018.Fall #	A,B,C,D,E,F,C	5,H,J,K) - the	ere is no "I"	(Alpha	bet City (N	1odel 18.F Q16	)) 08 a-Question
Delever		D				2017	2016		
Balance Sheet		Page 20.10	<b>J Asset</b> le from reins	urore		2017	2016		
Sheet		UEP		urers.		n/a	3,710	<== ceded valu	<i><b>A</b></i> <b>C</b>
		UCAE				A	4,410	<== ceded valu	
			tments inclu	ding cash		51,800	43,100		65
		totarmves	thents hield	ung cash		51,000	43,100		
		Page 20.20	) Liabilities &	& Equity		2017	2016		
		UEP		• •		J	5,300	<== gross value	25
		UCAE				В	6,300	<== gross value	25
Income		Page 20.30	) Statement	of Income		2017	2016		
Statement		NWP				24,000	26,800		
		NEP				20,600	n/a		
			ims & adjust	-		С	n/a		
			R'S SHARE of			D	n/a		
			s & adjustme	-	5	E	n/a		
		NET invest	ment incom	e		2,700	n/a		
ъ " Г								414 2047	
Runoff	CV	Page 60.41 Discounte	د Net Clms 8 م	a Adj Exps Ri	unoff	AV 2016	AV 2017	AY 2017	
F	<b>CY</b> 2016	UCAE	end of year			AY 2016 1,700	AY 2017	& prior	
	2010	IBNR	end of year			2,700			
-	2017	Paid	during year			E 2,700	n/a	n/a	
	2017	UCAE	end of year			۲ 1,100	n/a	2,800	
		IBNR	end of year			1,100	n/a	Z,800	
			t income fro		BNR	G	ny a	IX .	
		Amount:	excess/defi			n/a			
		Ratio:	excess/defi			H			
		·							
Bond		rating	class	book val.	mkt. val.	duration	yield		
Portfolio		govt	HTM	2,000	2,000	1.7	1.3%		
		AAA	HTM	14,000	11,480	14.0	4.0%		
		A	HTM	1,000	1,160	2.0	6.6%		
				1					
Triangle			d loss (cumu				aid loss ( <u>un</u> o		
Data		AY	12 1,300			AY 2016	12 n/a	24	
		2016 2017				2018		3,900	
		2017	1,500			2017	6,500		
Payment		year 1	20%	1	MfADs	MfAD (clain	ns):	6.00%	
Pattern		year 2	10%		•••••	MfAD (re):	- / -	7.00%	
(incremental)		year 3	70%			MfAD (inv):		1.75%	
,		·		4				are RETENTION	==> 30%

.0398 ^ 0.5
.0398 ^ 1.5
.0398 ^ 0.5
ep 1)
7

A & B are very easy	y: ( <u>B</u> is the n	et claims <b>liability</b> , <u>A</u> is	s the reinsuran	ce recoverable <b>asset</b> )		
A B		7,044 10,762	UCAE recov gross UCAE	verable from reinsurer liability	(Step 3c) (Step 3a)	
C, D & E are more of	confusing:					
C	: =		due to GROSS	claims in 2017 <i>(think o</i>	f it as <b>negativ</b>	
	=	(2017 gross UCAE)	-	(2016 gross UCAE)	+	(gross paid in 2017) *
	=	В	-	given info	+	from paid triangle
	=	10,762	-	6,300	+	4,300
	=	8,762				
* (gros	ss paid in 2017)					
	=	2016 @ 24 -	2016 @ 12	+ 2017@	12	
	=	4,100 -	1,300	+ 1,500		
	=	4,300				
D	) = = =	the CEDED "income" (2017 ceded UCAE) A	due to CEDED ( - -	claims in 2017 (this is a (2016 ceded UCAE) given info	recoverable ; + +	) (ceded paid in 2017) ** <i>see below</i>
	=	7,044	-	4,410	+	3,010
	=	5,644				
* (ced	ed paid in 2017)					
	=	gross paid in 2017	х	70%		
	=	4,300	х	70%		
	=	3,010				
E	=	net "income" due to o C -	claims in 2017 D	(this is also <b>negative</b> i	income)	
	=	8,762 -	5,644			
	=	3,118				

F is easy: if you know that the year labels in the left column of the table represent Calendar Years and the year labels in the top row represent Accident Years

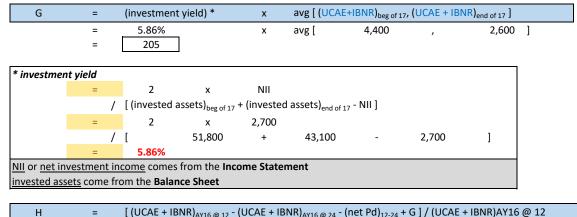
Use the paid loss triangle and the quota-share percentage



G & H are related:

H is the excess (deficiency) ratio and G is the investment income in the excess (deficiency) formula

You might like to review the practice template for the excess (defiency) ratio before proceding! In any case, we first need to calculate G. Note that UCAE + IBNR are directly from the Runoff exhibit in the given info.



[ (UCAE + IBNR)<sub>AY16 @ 12</sub> - (UCAE + IBNR)<sub>AY16 @ 24</sub> - (net Pd)<sub>12-24</sub> + G ] / (UCAE + IBNR)AY16 @ 12 =

Now:

(UCAE + IBNR) <sub>AY16 @ 12</sub>	=	1,700	+	2,700	=	4,400
(UCAE + IBNR) <sub>AY16 @ 24</sub>	=	1,100	+	1,500	=	2,600
(net Pd) <sub>12-24</sub>	=	F			=	840

Therefore:

н

=

26.5% <== Excess (Deficiency) Ratio

Recail the							
	EP	=	WP	-	chg(UEP)	]	
Apply this	s to our situatio	on to obtain	1:				
	NEP <sub>17</sub>	=	NWP <sub>17</sub>	-	[ (net UEP)	<sub>17</sub> - (net UEP) <sub>16</sub>	]
	20,600	=	24,000	-	[ (net UEP) <sub>1</sub>	<sub>17</sub> - ( (gross UEF	?) <sub>16</sub> - (ceded UE
Ok, this is	getting messy	so I'm goin	g to let you do	o the algeb	ra. Substitute	these values a	bove:
	(gross UEP) <sub>16</sub>	=	5,300	<== from	n Page 20.20	Balance Sheet	
	(ceded UEP) <sub>16</sub>	=	3,710	<== from	n Page 20.10	Balance Sheet	
The result	t is:						
	(net UEP) <sub>17</sub>	=	4,990				
And finall	y, using the <mark>qu</mark>	iota-share p	percentage to	GROSS UP	this net value	e, we obtain:	
	(gross UEP) <sub>17</sub>	=	(net UEP) <sub>17</sub>	/	30%		
	(gross OEP) <sub>17</sub>						
	J	=	4,990	/	30%		
			4,990 16,633		30%		
ly): K is (net II	J	= =	16,633 ard formula is	/ BIBNR = (To			
ly): K is (net II	J J BNR) <sub>17 &amp; prior</sub> an	= =	16,633	/ BIBNR = (To		) - Case (net Case) <sub>17 &amp;</sub>	prior
	J J BNR) <sub>17 &amp; prior</sub> an	= = id the standa	16,633 ard formula is	/ BIBNR = (To	otal Liabilities)		prior
(net IBNR <i>where</i> (net APV)	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior	= = id the standa	16,633 ard formula is	/ BIBNR = (To	otal Liabilities) -		prior
(net IBNR where	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior	= = ud the standa	16,633 lard formula is (net APV) <sub>17 8</sub>	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities; - 1 Step 3b	(net Case) <sub>17 &amp;</sub>	prior
(net IBNR <i>where</i> (net APV)	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub>	= = nd the stand: = =	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities; - 1 Step 3b	(net Case) <sub>17 &amp;</sub>	
(net IBNR where (net APV) (net Case)	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub>	= = nd the stand: = =	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities; - 1 Step 3b	(net Case) <sub>17 &amp;</sub>	
(net IBNR where (net APV) (net Case)	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub> e	= = nd the stands = = =	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities) - n Step 3b Runoff Exhib	(net Case) <sub>17 &amp;</sub>	
(net IBNR where (net APV) (net Case)	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub> e	= = d the stands = = = =	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800 3,718	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities) - n Step 3b Runoff Exhib	(net Case) <sub>17 &amp;</sub>	
(net IBNR where (net APV) (net Case) therefore	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <sub>17 &amp; prior</sub> e	= = d the stands = = = =	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800 3,718	/ : IBNR = (Tc <u>&amp; prior</u> <== fron	otal Liabilities) - n Step 3b Runoff Exhib	(net Case) <sub>17 &amp;</sub>	
(net IBNR where (net APV) (net Case) therefore n Summary: A B	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior )17 & prior e K	= = d the stands = = = = 7,044 10,762	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800 3,718	/ i IBNR = (Tc <u>* prior</u> <== from <== from - F G	n Step 3b Runoff Exhib	(net Case) <sub>17 &amp;</sub> hit ( <u>2017</u> UCA 840 205	
(net IBNR where (net APV) (net Case) therefore n Summary: A B C	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <u>17 &amp; prior</u> e K K	= = d the stands = = = = = 7,044 10,762 8,762	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800 3,718	/ iBNR = (Tc <u>* prior</u> <== from <== from - F G H	stal Liabilities) - - - - - - - - - - - - - - - - - - -	(net Case) <sub>17 &amp;</sub> nit ( <u>2017</u> UCAR 205 26.5%	
(net IBNR where (net APV) (net Case) therefore n Summary: A B	J J BNR) <sub>17 &amp; prior</sub> an ) <u>17 &amp; prior</u> 17 & prior ) <u>17 &amp; prior</u> e K	= = d the stands = = = = 7,044 10,762	16,633 lard formula is (net APV) <sub>17 8</sub> 3,718 2,800 3,718	/ i IBNR = (Tc <u>* prior</u> <== from <== from - F G	n Step 3b Runoff Exhib	(net Case) <sub>17 &amp;</sub> hit ( <u>2017</u> UCA 840 205	