Paper: Problem: Problem Type:	OSFI.MCT Practice Calculate the dive	ersificat	ion credit and the fi	nal MCT ratio	(OSFI.MCT) 01a-Question				
Given:	CapAvail (GROSS): deduc(UnregRe): deduc(BC Limit):		69,500 0 1,625	CapReq(CapReq(CapReq(CapReq(diversific	InsRsk): MktRsk): CrdRsk): OpnRsk): Pation correlatio	35 2 10 0n:	35,584 9,000 4,550 10,597 0.5		
Concept:	MCT ratio min CapReq CapReq(tot)	= = =	CapAvail / min Ca CapReq(total) / 1 SUM(IMCO) - (div	apReq 1.5 versification cro	edit)				
Concept:	diversification cre	edit	= Sum	1 -	SQRT(Sum 2))			
	A	A = CapReq(Ass I = CapReq(Ins		sRsk) = CapReq(MktR Rsk)		Rsk) + CapReq(C	rdRsk)		
	Then : Sum 1 Sum 2	= =	A - A ² -	+ + ²	+ 2	2R x A x I			

template:	CapAvail DC CapReq minCapReq MCT ratio		= = = =	67,875 5,180 54,552 36,368 187%	= = = =	CapAvail(GROSS) - deduc.1 - deduc.2 A + I - sqrt(A ² + I ² + 2RAI) SUM(IMCO) - DC CapReq / 1.5 CapAvail / minCapReq
MCT ratio	=	187%				
minCapReq	=	36,368				
CapRed(tot)	=	54,552				
diversifica	ation credit	=	5,180			

(Sum 1)	=	49,134
SQRT(Sum 2)	=	43,954

Paper:	OSFI.MCT			(OSFI.MCT)	02a-Question				
Problem:	Practice								
Problem Type:	Calculate th	e MCT capital available GROSS of	deductions						
A/R Ref:	page:	30.62							
Notation:	CapAv:	(\$) GROSS Capital Available							
	R/E	(\$) Retained Earnings	(\$) Retained Earnings						
	AOCI	(\$) Accumulated Other Comprehensive Income							
Concept:	There are se gross of dec Items poten	There are several 'normal' items that are always summed as the first step in calc'ing CapAvail gross of deductions. These are from p30.62 of the sample qtrly return. <i>Items potentially modified by additions/deductions are shown in red and are discussed later.</i>							
Given:	qualifying c	ategory A common shares:	28,500						
	contributed	surplus:	2,000						
	R/E:	•	6,500						
	reserves:		2,500						
	AOCI:		7,000						
	qualifying c	ategory B instruments:	16,500						
	qualifying c	ategory C instruments:	6,000						
	non-control	lling interests:	500						
Note:	This probler	m is trivial because all you do is su	ım the given guantities. Bu	It before going to the					
	next problei	m, you should MEMORIZE the nam	nes of these 8 items, AND	be able to list the 4					
	that can po	tentially be modified.	-						



Paper:	OSFI.MCT						(OSFI	I.MCT) (03a-Question
Problem:	Practice								
Problem Type:	Calculate the d	eduction fron	n MCT capit	al available	e for unregi	stered reins	surance reco	verables	
A/R Ref:	page:	70.60 (Cdn Ir	nsurers)						
	page:	70.61 (Forei	gn Insurers)						
Notation:	UEP ceded:	(\$) UnEarned	d Premiums	ceded to a	ssuming re	insurer			
	O/S Recov:	(\$) OutStand	ling losses R	Recoverable	e from assu	ming reinsu	rer		
	Reins Recv:	(\$) Reinsurai	nce Receiva	ble		-			
	Reins Pay:	(\$) Reinsurai	nce Payable	2					
NOD: (\$) Non-Owned Deposits (<i>RSA + Other</i>) & includes FUNDS to secure payment from assuming insurer (the FUNDS inclusion is new for 2018)									
	LOC:	(\$) Letters Of Credit							
Concept:	D =	(UEP + O/S F	Recov + Reii	ns Recv) - (Reins Pay	+ NOD + LO	C)	PolocP c	oparatoly
Civon	A /B p70 60		0/5	Poinc	Poinc	l		Remsk s	eparately
Given.	Α/Ν μ/0.00	coded	recov	Recy	Pav	NOD	100		
	namo	(20)	(22)	(24)	ray (26)	(22) + (24)	(28)		
		15,000	E 000	2 000	0.000	(32) + (34) 8 000	6 000		
		13,000	3,000	2,000	9,000	8,000	0,000		
	DEFRE	15.000	E 000	2 000	0.000	000 ×	6.000	6 000	.
		13,000	5,000	2,000	9,000	6,000	0,000	0,000	J
Answer:	deduction =	max(0, D)	* D must b	e > 0 to effe	ect a deduc	tion in CapA	Avail		

Note: If completing page 70.60 or 70.61, we would then just drop the ABS(D) into either col (42) or (44)



D = -1,000

Paper:	OSFI.MCT						(OSFI.MCT)	04a-Question		
Problem:	Practice									
Problem Type:	Calculate the	e deduction fro	om MCT capi	tal availab	le for limits d	on category B &	C instruments			
Notation:	BC:	limit for (C	at B + Cat C)							
	C:	limit for (C	at C)							
Concept:	To calculate	deduction, pe	rform the fol	lowing 'val	lidation' test	s:				
	BC	=	40%	х	(CapAvail - J	AOCI)				
	С	=	7%	x	(CapAvail - /	AOCI)				
	We calc'd CapAvail in MCT.01a, and AOCI was given.									
	Then calc how much									
	(Cat B + Cat C) exceeds BC: BC - (Cat B + Cat C)									
	(Cat C) exc	eeds C:	(C - (Cat C)						
Answer:	deduction =	max(0, abc	ove two amo	unts)]					
Concept:	Here, the Ca	pAvail is AFTEI	R the deduct	ion for unr	egistered rei	nsurance.				
Given:	CapAvail (GR	OSS):	69,500							
	deduc for un	reg re:	0							
	AOCI:		7,000							
	qualifying ca	tegory B instru	uments:		16,500					
	qualifying ca	tegory C instru	iments:		6,000					

deduction =		1,625		final CapAvail	=	67,875	(OSFI.MCT)	04b-Answer
							actual	
							minus	
						limit	limit	
BC	=	62,500	х	40%	=	25,000	0	
С	=	62,500	х	7%	=	4,375	1,625	

* do you subtract the unreg reins deduc BEFORE applying the 40% and 7%?

--> YES! (according to the answer key for 15.S)

--> NO! (according to the actual MCT paper, but since there are no exs in the paper, its hard to verify)

- the paper isn't sufficiently precise regarding the term 'capital available', whether it means GROSS or after deductions

--> WAIT! Now I get it!!

- you do ALL the 'extra deductions to get CapAvail THEN do the validation tests

- i.e. use (NetCapAvail - AOCI) in validation test

Paper:	OSFI.MCT		(OSFI.MCT) 05a-Question								
Problem:	Practice										
Problem Type:	Calculate the MCT capital required at ta	arget for <mark>in</mark>	surance risk								
Given:	summary of elements of insurance risk		(amts required ABOVE & BEYOND normal reserves)								
		CapReq									
	unpaid clms	14,070									
	premium liabilities	14,514									
	unregistered reinsurers	2,000									
	self-insured retention	n/a									
	catastrophes	5,000									
	accident & sickness business	n/a									
Concept:	CapReq(InsRsk) = SUM(above items)]								
Question:	how is the MCT CapReq different from	the APV of	the PolLiabs								
Answer:	APV accounts for some of the InsRsk, N	APV accounts for some of the InsRsk, MktRsk, & CrdRsk that is within the MCT framework:									
	- Clms Devlpt (InsRsk)										
	- ReIns rsk (InsRsk & Cr	dRsk)									
	- IntRt rsk (MktRsk)										
	But the MCT margins account for much	more thar	n what's included in the MfADs								

Also, the methodology underlying the MCT is rules-based, whereas the the CIA's MfAD paper is principles-based. (This is aside from a couple of specific rules in the MfAD paper for calculating IntRt margins using the weighted formula or explicit quantification methods.)

(OSFI.MCT) 05b-Answer

35,584

CapReq(InsRsk) =

Paper:	OSFI.MCT				(OSFI.MCT)	06a-Question
Problem:	Practice					
Problem Type:	Calculate the	unpaid clms co	omponent for MCT ca	pital required at target for insu	rance risk	
Recall: (from MfAD.01a)	NU:	(\$) Net UCA	E & IBNR, discounted	(x PfADs)		
Given:	line	* NU	margin	* discounted, excluding PfADs		
	property	49,000	13%			
	auto-L	77,000	10%			
		126,000				
	-			-		
Concept:	CapReq(unpd) = SumProduc	ct(NU x margin)			

(OSFI.MCT) 06b-Answer

CapReq(NU) =



Paper: Problem: Problem Type:	OSFI.MCT Practice Calculate the pr	remium liabil	ities comp	onent for M	ICT capital r	equired at tar	(OSFI.MCT) get for insurance r	07a-Question risk
Notation:	NPrLb: DWP: AWP: CWP:	Net Premiur Direct Writte Assumed W Ceded WP	n Liabilitie: en Premiur P					
				DWP	AWP	CWP		
Given:	line	NPrLb	margin	pr 12 mth	pr 12 mth	pr 12 mth		
	property	15,000	18%	81,000	20,000	10,000		
	auto-L	60,000	16%	104,000	23,000	28,000		
		75,000		185,000	43,000	38,000		
Concept:	SUM over LOBs where	Max (NWP :	x 30% , NPi DWP + AW	rLb) x marg P - CWP	in			

	_					
	NWP	NWP	NPrLb	Max of	margin	
		x 30%		(2) & (3)		(4) x (5)
line	(1)	= (2)	(3)	= (4)	(5)	=(6)
property	91,000	27,300	15,000	27,300	18%	4,914
auto-L	99,000	29,700	60,000	60,000	16%	9,600
						14,514

Paper: Problem:	OSFI.MCT Practice						(OS	FI.MCT)	08a-Question	
Problem Type:	Calculate the <mark>u</mark>	inregistered r	einsurance o	componen	t for MCT c	apital requii	<mark>ed</mark> at targe	t for InsRs	sk	
Recall:	D = and	(UEP + O/S	Recov + Reii	ns Recv) -	(Reins Pay	+ NOD + LO	C)			
	deduction fron	deduction from CapAvail for unregistered reinsurance = max(0,D)								
Given:	A/R p70.60	UEP	O/S	Reins	Reins					
		ceded	recov	Recv	Рау	NOD	LOC			
	name	(20)	(22)	(24)	(26)	(32) + (34)	(38)			
	ABC Re	15,000	5,000	2,000	9,000	8,000	6,000			
	DEF Re	0	0	0	0	0	0			
		15,000	5,000	2,000	9,000	8,000	6,000			
		x 30	%				Tot.LOC ok			
		6,00	00							
Concept:	D = (UEP + O/S	5 + Rec) - (Pay	+ NOD + LO	DC)						
	x 15%	- r	nax(0,-D)	=	CapReq(Un	nregRe)	(if +ve, OK,	o.w set t	o 0)	
Note:	High values of	(UEP, O/S) lea	nd to a <mark>high</mark> e	er CapReq						
	D > 0:	deduction fr	om CapAva	il: yes	reduction t	o CapReq: r	10	(MCT lov	ver)	
	D < 0:	deduction fr	om CapAva	il: no	reduction t	co CapReq:)	res	(MCT hig	her)	
	D = 0:	no effect on	CapAvail or	r CapReq				-		

CapReq(UnregRe) =

modified from 'normal' calc for D when LOC limit has been breached (subtract min(6000, 6000) instead of LOC) (1) (2) (3) (4) 15% х (UEP + O/S) max(0,-D)(2) - (3) max[0,(4)] D -1,000 3,000 1,000 2,000 2,000 0 0 0 0 2,000 = CapReq(UnregRe)

2,000

margin reduction 3,000 -21,000

^{*} D must be < 0 to effect an decrease in CapReq

Paper:	OSFI.MCT
Problem:	Practice
Problem Type:	Calculate the MCT capital required at target for credit risk

Given:	A/R p70.60	UEP	O/S	Reins	Reins					
		ceded	recov	Recv	Рау	NOD	LOC		Capital	
	name	(20)	(22)	(24)	(26)	(32) + (34)	(38)		Factor	
	ABC Re	15,000	5,000	2,000	9,000	8,000	6,000	NOD:	0.25%	
	DEF Re	0	0	0	0	0	0	LOC:	0.50%	
		15,000	5,000	2,000	9,000	8,000	6,000			
						CapReq				
	counter-party d	lefault risk fo	r B/S assets	:		3,000 < need shts that calc t				
	counter-party d	lefault risk fo	r off-B/S ex		1,500	1,500 < need shts that calc this				
	counter-party d		50.0	< need sh	its that calc	this				

proportional allocation of xs collateral:

0.0%

Concept: CapReq(CrdRsk) = sum(CP Default Risks)

* the only item we don't have is the one for UnregRe & SIRs

4,550.0

AHA! I finally see the point in calculating the reduction in CapReq for xs collateral.You need the proportional allocation to calculate the 3rd component of CapReq(CrdRsk)

WITHOUT any reduction in CapReq for xs collateral, the CP DefRsk for UnregRe & SIRs would be:

(NOD x CapFctr) + (LOC x CapFctr) = 50.0

BUT, we must multiply this by (1 - proportional allocation):

50.0 x 100.0% = 50.0

Paper: Problem:	OSFI.MCT Practice						(OSFI	.MCT) 1	0a-Question	
Problem Type:	Calc reduction i	n CapReq FO	R (xs collate	eral) SUPPO	RTING (Re	Ins ceded to	UnregReins)			
Given:	A/R p70.60	UEP	O/S	Reins	Reins					
		ceded	recov	Recv	Рау	NOD	LOC		Capital	
	name	(20)	(22)	(24)	(26)	(32) + (34)	(38)		Factor	
	ABC Re	15,000	5,000	2,000	9,000	8,000	6,000	NOD:	0.25%	
	DEF Re	0	0	0	0	0	0	LOC:	0.50%	
		15,000	5,000	2,000	9,000	8,000	6,000			
		•								
Concept:	A: collateral re	equired to re	duce (marg	in required) to 0		* see p32 of	MCT pape	er 💦	
	+	115% x (UEP	+ O/S)							
	+	receivables								
	-	payables								
	B: total collateral									
	+	NOD + LOC								
	C: excess colla	teral	= r	nax(0, B-A)						
	THEN proportion	=	excess / tota	I = C/B						
Concept:	CapReq(collate	ral)	= 5	SumProduct	(CapFctr,	collateral)				
Concept:	CapReqReduc		= (CapReq(coll	ateral) x (<mark>p</mark>	roportional	allocation)			

0.0

(OSFI.MCT) 10b-Answer

Note: See p13 in MCT paper for this topic

+ + - A:	23,000 2,000 9,000 16,000		115% x (UEP receivables payables	+ O/S)		
В:	14,000		NOD + LOC			
C:	0	=	max(0, B-A)			
proportional a	allocation		=	0.0%	=	excess / total = C / B
CapReq(collateral) =		=	50.0	without redu	ıction	
CapReqReduc	:	=	0.0			

Paper:	OSFI.MCT					(OSFI.N	ICT) 11a-Question			
Problem:	Practice									
Problem Type:	Calculate the MCT capital required at target for operational risk									
Notation:	AWP(ig):									
	CWP(ig):									
Given:	CapReg(InsF	sk):	35,584	- already	calc'd					
	CapReg(Mkt	Rsk):	9.000	- aiven						
	CapReq(Crdl	Rsk):	4,550	- already	calc'd					
	DWP:		185.000							
	AWP		43 000		AWP(ig)	0				
	CWP		38,000		CWP(ig):	0				
	growth [.]		22 00%			0				
	Bromein		22.0075							
Concept:	CR(0)	= CapReg		before	(operational risk . dive	ersification credi	t)			
	- (-)	= CapReq	(InsRisk)	+	CapReq(MktRisk)	+ Cap	Req(CrdRisk)			
Concept:	upper limit o	on CapReq(Op	nRsk)	=	30% x CR(0)					
Concept:	Use WP and appropriate factors to determine if CapReq(OpnRsk) should be lower									
	than the give									
Concept:	CapReq(Opr	Rsk) =	Min [30% :	x CR(0), <mark>SU</mark>	M(str1) + <i>Max</i> (str2)]					

CapReq(OpnRsk) =

10,597

* purpose: dampens OpnRsk for cos. with (HighVol-LowComplexity) business with (High Levels of ReIns)

CR(0)	=	49,134	x 30% >	14,740	= u	pper limit on	n CapRe	q(OpnRsk)		
1st string of	compo	nents for altern	ative to	ultimate cap						
8.50%	х	CR(0)			4,176					
2.50%	х	DWP			4,625					
1.75%	х	AWP								
2.50%	х	CWP			950					
2.50%	x	2.00%	x	(DWP + AWP)	wth)	sum	=	10,597		
2nd string o	f compo	onents for alterr	native to	ultimate cap -	prems fror	n INTRA-GRP	POOLI	NG		
0.75%	х	AWP(ig)			0					
0.75%	х	CWP(ig)			0			max	=	0
				SU	M(str1) + I	MAX(str2)	=	10,597		