2. Common logarithms.

1.	Log 31.59 1.4996 Log a 2.6182 Log $b^{1/3}$ $\bar{2}8.814$ 3 Log b $\bar{4}.6442$ b = 0.0004407 b = 0.0004	**M1** **M1** **A1** **B1**	Subt b logs Multip by 3
		04	
2.	$\log_{10}25 - \log_{10}4 + \log_{10}1600$ $\log_{10}\left(\frac{25}{4}\times 1600\right)$ 4	**M1** **M1** **A1**	
		03	
3	<table><tr><td>No. $(0.00246)^2$ 142 0.002 1.14 3.3527</td><td>Std. form $(2.46 \times 10^{-2})^2$ 1.42×10^2 2.0×10^{-3} 1.14×10^o 3.3527×10^o</td><td>Log 2.3909 x 2 4.7818 +2.1523 2.9341 3.3010 +0.0569 3.3579 2.9341 -3.3579 1.5762 1.5762 3 0.5254</td></tr></table>	1M 1M 1M A1	Correct logs addition Correct logs addition Correct logs substractions Correct answer
		4	
4	$\frac{\log\left(\frac{1}{4}\times 64\right)}{\log\left(\frac{1}{32}\div\frac{1}{8}\right)}$ $\frac{\log 2^4}{\log 2^{-2}}$ $\frac{4\log 2}{-2\log 2}$ -2	M_1 M_1 M_1 $\frac{A_1}{4}$	

5. $\left(\frac{1}{2^3}\right)^x \cdot \left(2^6\right)^2 = \left(2^4\right)^2$ M1 for writing in index form

$2^{-3x}.2^{12} = 2^8$

$12 - 3x = 8$ M1

$x = {}^{4}/_{3}$
$= 1\ {}^{1}/_{3}$

3

6.	No. std form log 0.6845^2 6.845×10^{-1} $\bar{1}.8354\times2$ $\bar{1}.6708$ $\bar{1}.6708$ 0.08416 8.416×10^{-2} $\bar{2}.9252$ 3 $\bar{1}.6417$ $\bar{1}.6417 +$ $\bar{1}.3125$ 0.005937 5.937×10^{-3} $-\ \bar{3}.7736$ 3.459×10^{-1} ← $\bar{1}.5389$ 0.3459	M1 M1 M1 A1	
		04	

7	Number / log 8.694 0.9392 0.1267 $\bar{1}.1028\times\frac{1}{3}=\bar{1}.7009$ 0.006974 $\bar{3}.8434$ $\bar{3}.5443\times\frac{3}{4}$ $\bar{1}.3861\times3=\bar{2}.1583$ 0.9392 $\bar{2}.1583$ 2.7809 6.039×10^{2} 602.9	M1 M1 M1 A1	All logs + - x of logs $\div\times of$ logs	
		4 marks		

8.

No.	*Log*	
2849	*3.4547*	
		+
-		
0.00574	*3. 7589*	
1.2136		
36.891.1	*1. 5669*	
-		
0.023	*2.3617*	
	3.2052	
-		
2. 0084	*x ¼*	
-		
3.178 x 10^{-1}	*1. 5021*	
→	*0.3178*	

All logs read correctly

Correct Addn /subst. of logs.

9. $Log\ y = log\ B + n\ log\ x$

$n\ log\ x = log\ y - log\ B$

$n = \frac{Log\ (y/B)}{Log\ x}$

10. $= 6\ log_2\ 4 + 10\ log_3 3$

$= 12\ log_2 2 + 10\ log_3 3$

$= 12 + 10$

11. $Log\ \frac{2x - 11}{2} = \frac{log\ 3}{x}$

$(2x - 11) = 3/x$

$2x^2 \_ 11x - 6 = 0$

$(2x + 1)(x - 6) = 0$

$x = -\frac{1}{2}$ or 6

$x = 6$

12.

No.	Log
0.5241	T.7194
$(0.5241)^2$	T.7194x2
	T.4388 +
83.59	1.9222
	1.3610
0.3563	T.5518
$3\sqrt{0.3563}$	(3+2.5518) ÷3
	T.8506
	0.3610 –
	1.8506
$3.239x10^1$	1.5104
$= 32.4$	

13.

No.	Log
38.32	1.5834
12.964	1.1127
	2.6961
86.37	1.9364
6.285	0.7783
-	2.7347
	1.9587

$\frac{\bar{3} + 2.9587}{3} = 1.9866$

$= 0.9695$

14. $H^3 \sim \frac{3d(L-d)}{10L}$

$\sim 3dL - 10H^3L = 3d^2$

$\sim L(3d - 10H^3) = 3d^2$

$L = \frac{3d^2}{3d - 10H^3}$

15.

No.	Log
6.195	0.7920
11.82	1.0726
	1.8646
83.52	1.9218
	$\bar{1}.9428 \times \frac{1}{4}$
	$\bar{4}. + 3.9428$
	4
0.9676	$\bar{1}.9857$

16. $\log y^2 (x-1) = \log 9 \quad y^2 (x-1) = 9 \quad ....(1)$

$\log (xy) \log 6 \quad xy = 6 ....2$

from (2) $x = {}^{6}/_{y}$

substitute in (1) $y\frac{(6-1)}{y} = 9$

$6y - y^2 = 9$

$y^2 - 6y + 9 = 0$

$(y-3)^2 = 0$

$y = 3$

$\therefore x = 2$

17. ${}^{5}/_{4} \log_{10} 25 + \log_{10} 25x2 - \log 10$

$4 \log 2 = \log_{10} 25x2 - 3\log 2$

$2 \log 10 + 2 \log 5$

$\log 10 \times 100$

18.

NO	LOG	
0.9895 →	$\bar{1}.9954$	
$(0.9895)^2$ →	$\bar{1}.9954 \times 2$	Use sine rule
	1.9908	
0.004974 →	$\bar{3}.6968$	
	$\bar{3}.6876 \div 4$	
	1.4219×3	
6.598	2.2657	
	0.8195 –	
	2.2657	
$3.579 X10^2$ ←	2.5538	
OR 357.9		

19. Log 3x + 8 – log 8 = log (x-4)

$\text{Log}\left(\frac{3x+8}{8}\right) = \log(x-4)$

$3x + 8 = x - 4$

$3x + 8 = 8x - 32$

$5x = 40$

20.

No.	*Log*
36.72 ⟶	*1.5649*
0.46^2 ⟶	*2(T.6628)*
	T.3256
185.4	*0.8905*
	2.2682
	$2.9223 \times \frac{1}{3} = \frac{3}{3} + \frac{1.6223}{3}$
3.474×10^{-1}	
Or 0.3474	*1.5408*

21.

No		*Log*
Sin 44.5		*1.8457*
Tan 14.9	*1.4250*	*2.5686 -*
Cos 82	*1.1486 +*	
	$\frac{1.2772}{2}$	
10 x 4.351	*0.6386*	

22. From square roots $\frac{12.25}{3.264 \times 1.215 \times 3.5} = 3.5$

$\sqrt{x}\ 107$

$1.088 \times 0.4725 \times 107$

$\frac{3264 \times 1215 \times 35}{1088 \times 4725}$

$\sqrt{27} = 3$

23. $\text{Log}_8(x + 5) - \log_8(x - 3) = \text{Log}_8 4$

$\text{Log}_8 \left(\frac{x+5}{x-3}\right) = \log_8 4$

$\frac{x+5}{x-3} = 4$

$x - 3$

$4x - 12 = x + 5$

$3x = 17$

$x = 17 = 5^2/_3$

Or $\log_8 \frac{x+5}{x-3} = \frac{2}{3}$

$8^{2/3} = \frac{x+5}{x-3}$

$2^3(^2/_3) = \frac{x+5}{x-3}$

$2^2 = \frac{x+5}{x-3} \Rightarrow 4 = \frac{x+5}{x-3}$

$4x - 12 = x + 5 \Rightarrow 3x = 17$

$x = \frac{17}{3} = 5^{2}/_{3}$

24.

No	Log
6.57^2	0.8176
	$\underline{\quad 2x}$
	1.6352
$4.317 \text{ X } 10^1$	
43.17 + 6.57	
49.74	
$(7.92)^2$	1.6967
	0.8987
	$\underline{\quad X2}$
	1.7974
$\underline{30.08}$	1.4783 + $\underline{3.2757}$
$2.636 \text{ X } 10^{-2}$	2.4210
	= 0.02636
	= 0.0264 (4 d.p)

No	Log
6.57^2	0.8176
	$\underline{\quad 2x}$
	1.6352
$4.317 \text{ X } 10^1$	
43.17 + 6.57	
49.74	
$(7.92)^2$	1.6967
	0.8987
	$\underline{\quad X2}$
	1.7974
$\underline{30.08}$	1.4783 + $\underline{3.2757}$
$2.636 \text{ X } 10^{-2}$	2.4210
	= 0.02636
	= 0.0264 (4 d.p)

25. $\text{Log } 120 = \log 4 + \log 3 + \log 10$
$= \log 22 + \log 3 + \log 10$
$= 2\log 2 + \log 3 + \log 10$
$= 2(0.30103) + 0.47712 + 1$
$= 2.07918$

26. $\text{Log}_2 (3x - 4) = {}^1/_3 \text{ lo}_2 8x^6 - \log_2 4$
$\text{Log}_2 (3x - 4) = \log_2 (2^3 x^6) - \log_2 4$
$\text{Log}_2 (3x - 4) = \log_2 2x^2 - \log_2 4$

$Log_2 (3x - 4) - log_2 \left(\frac{2x^2}{4}\right)$

$= 3x - 4 = \frac{2x^2}{4}$

$2x^2 - 12x + 16 = 0$

$x^2 - 6x + 8 = 0$

$x - 2x - 4x + 8 = 0$

$(x - 2)(x - 4) = 0$

$x = 2$ or $x = 4$

27.

No	Log
5.627	0.7503
$(0.234)^3$	T. 3692
	x 3
	2.8579
8.237	0.4779 $\frac{0.9158}{2}$
2.399×10^{-3}	3.3800
	= 0.002399

28. Det 2 - -3 = 5

Area of $A^IB^IC^I = 5 \times 15$

$= 75\ cm^2$

29. $Log10(6x-2) - log10 = log10(x-3)$

$Log \frac{(6x-2)}{10} = log\ (x-3)$

$\frac{6x-2}{10} = x - 3$

$6x - 2 = 10x - 30$

$x = 7$

30.

No.	Log
0.07526^2	$2.8766 \times 2 = 3.7532$
6.652	$0.8230 = 0.8230$
	4.9302

$\frac{4.9302}{3} = 6 + \frac{2.9302}{3}$

$= 2.9767$

Antilog $= 9.4776 \times 10^{-2}$

$= 0.094776$(accept 0.09478)

No.	*Log*
4.283	*0.6317*
0.009478^2	*3.9767 X 2 +*
	5. 9534
	4.5851 -
Log 9.814	*1.9964*
	4. 5887 ÷ 5
$2.0785 X 10^{-1}$ ←	*1.3177*
= 0.20785	