Year 11 Maths Homework 12 Exam Q's Due Date: _____ Name: _____ Score: /21

Answer all questions, make sure you <u>show all working</u> otherwise you will not be awarded marks. If you write on any other paper, please hand this in with the sheet.

Q1. The diagram shows a triangle

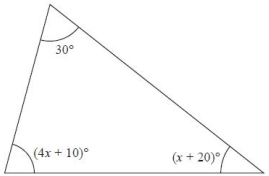


Diagram **NOT** accurately drawn

Work out the value of x. Show all working.

x = ...

(Total for question = 4 marks)

2.

$$T = \frac{p}{r}$$

p = 0.51 correct to 2 significant figures.
r = 6.3 correct to 2 significant figures.

Work out the upper bound for the value of *T*
Show your working clearly.

.....

(Total for question = 2 marks)

3.

(a) Use algebra to show $0.\dot{3}\dot{2}\dot{4} = \frac{107}{330}$ (2)

(b) Rationalise the denominator of $\frac{4}{7-\sqrt{5}}$

Show each stage of your working.

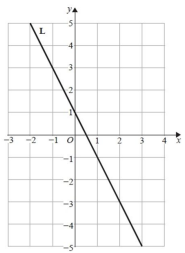
Give your answer in the form where *a* and *b* are fractions in their simplest forms (3)

(Total for question = 5 marks)

Q4.

Here is the straight line **L** drawn on a grid.

Find an equation for **L**.



.....

(Total for question = 2 marks)

Q5.

The function f is such that f (*x*) = 3*x* – 2

(a) Find f (5)

.....(1)

The function g is such that g(*x*) = $2x^2 - 20x + 9$ where $x \geq 5$

(b) Express the inverse function g^{-1} in the form $g^{-1}(x)$ = ...

$g^{-1}(x)$ = ...(4)

(Total for question = 5 marks)

Q6.

Here is a right-angled triangle.

Work out the value of *x*.
Give your answer correct to one decimal place.

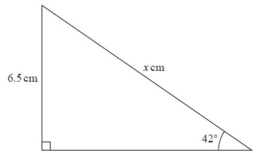


Diagram **NOT** accurately drawn

x = ...

(Total for question = 3 marks)

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Question	Working	Answer	Mark	Notes	
	$30+4x+10+x+20$ (= $5x+60$) **or** $180-30$ (=150)		4	M1 Allow $5x+60=n$ where $n \neq 180$ or for subtracting 30 from 180	M2 for $5x+30=150$ oe
	e.g. $30+4x+10+x+20=180$ **or** $5x+60=180$ oe **or** $180-30-10-20$ (=120)			M1 for setting up the equation or for subtracting all numerical values of angles from 180	
	$5x=$ '120' **or** '120' ÷ 5			M1 for correctly simplifying to $ax=b$ or for dividing '120' by 5	
		24		A1 for 24	
					Total 4 marks

Q	Working	Answer	Mark	Notes
	$\frac{0.515}{6.25}$		2	M1 For either bound correct (used or seen)
	Working required	0.0824		A1 dep on M1 Allow $\frac{103}{1250}$
				Total 2 marks

Q		Working	Answer	Mark	Notes
	(a)			2	M1 For selecting $10x = 3.2424....$ and $1000x = 324.2424...$ oe
			show		A1 $\frac{321}{990}$
	(b)	e.g. $\frac{4(7+\sqrt{5})}{49-5}$	$\frac{7}{11}+\frac{1}{11}\sqrt{5}$	3	M1 For multiplying the numerator and denominator by $(7+\sqrt{5})$ M1 For a correct single fraction with brackets expanded in denominator A1 dep on correct working seen
					Total 5 marks

Answer	Mark	Notes
$y=-2x+1$	2	M1 For $y=-2x+c$ $(c \neq 1)$ or $y=mx+1$ or for a correct method to find the gradient or $m=-2$ and $c=1$ stated A1 or $-2x+1$ or $L=-2x+1$ oe
		Total 2 marks

Question		Working	Answer	Mark	Notes
	(a)		13	1	B1
	(b)	$y=2(x^2-10x)+9$ **or** $y=2\left(x^2-10x+\frac{9}{2}\right)$			M1 for a correct equation for a first step in order to complete the square
		e.g. $y=2\left((x-5)^2-5^2\right)+9$ **or** $y=2\left((x-5)^2-5^2+\frac{9}{2}\right)$ **or** $y=2(x-5)^2-41$ oe			M1 dep
		$(x-5)^2=\frac{y+41}{2}$ oe			M1
			$5+\sqrt{\frac{x+41}{2}}$	4	A1 oe
					Total 5 marks

Note: Allow candidates to swap *x* and *y* when finding the inverse

Q	Working	Answer	Mark	Notes
	$\sin 42=\frac{6.5}{x}$ **or** $\frac{x}{\sin 90}=\frac{6.5}{\sin 42}$ oe **or** $\cos 48=\frac{6.5}{x}$ [where $48=180-90-42$]		3	M1 **or** use of tan to find the horizontal side **and** then a correct first step in Pythagoras' theorem ie [base =] $\frac{6.5}{\tan 42}$ (= 7.21...) and $[x^2=]\ 6.5^2+"7.21..."^2$
	$[x=]\ \frac{6.5}{\sin 42}$ **or** $\frac{6.5\sin 90}{\sin 42}$ **or** $[x=]\ \frac{6.5}{\cos 48}$ [where $48=180-90-42$]			M1 **or** complete method using Pythagoras $[x=]\sqrt{6.5^2+"7.21..."}$ (If students give this statement with nothing before it they gain M2)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	9.7		A1 accept 9.7 – 9.72
				Total 3 marks