

## Topic 19 Proportion equations (Pre-TT) [28] MARKSCHEME

1.

<b>Alternative method 1</b>		
$2 = k\sqrt{36}$ or $\sqrt{36} = 6$	M1	
$(k =) 2 \div \text{their } 6$ or $\frac{1}{3}$	M1dep	
$5 \div \text{their } \frac{1}{3}$ or $15 (\sqrt{a} =)$	M1	oe
225	A1	
<b>Alternative method 2</b>		
$2k = \sqrt{36}$ or $\sqrt{36} = 6$	M1	
$(k =) \text{their } 6 \div 2$ or $3$	M1dep	
$5 \times \text{their } 3$ or $15 (\sqrt{a} =)$	M1	oe
225	A1	
<b>Alternative method 3</b>		
$2k = \sqrt{36}$ or $\sqrt{36} = 6$	M1	
$5 \div 2$ or $2.5$	M1	
$\text{their } 6 \times \text{their } 2.5$ or $15 (\sqrt{a} =)$	M1dep	dep on M1 M1
225	A1	

2.

(a)  $R \propto 1/I$  or  $R = k \frac{1}{I}$  M1

$12 = \frac{k}{8}$  M1

*Implies 1<sup>st</sup> M1*

$k = 96$

$R = \frac{96}{I}$  A1

*Or IR = 96*

*Marks can be awarded if answer seen in (b)*

(b)  $I = \frac{96}{6.4}$  A1

*ft dep on M1 in (a)*

$= 15$  A1

[5]

3.

D	B1
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4.

$y \propto \frac{1}{\sqrt{x}}$  or  $y = \frac{k}{\sqrt{x}}$  M1  
*oe*

$k = 8$  A1  
 $k = -8$

$(y =) 16$  A1  
 $-16$

[3]

5.

(a)  $d = kt^2$  M1  
*Allow  $d \propto t^2$*

$490 = k \times 100$  M1 dep

$k = 4.9$  A1

*$d = 4.9 t^2$  only needed if equation not seen for first M1*

(b) 30.625 B1 ft

*ft only from  $d = kt^2$  with incorrect  $k$   
 Condone 30.6 and 30.63*

(c) Correct sketch of parabola starting from origin B1

[5]

6.

(a)  $L = \frac{k}{d^2}$

$2 = \frac{k}{10^2}$

or  $2 = \frac{k}{100}$  or  $k = 200$

$L = \frac{200}{d^2}$  M1, M1, A1

*or  $Ld^2 = 200$*

(b) 50 B1

(c)  $d = \sqrt{200/8}$  M1  
*oe*

$d = 5$  A1

[6]

7.

Test the data using  $h = kt$ ,  $h = kt^2$   
 or  $h = kt^3$  M1  
*must find a value of 'k'*

Test one of the laws to reach a correct conclusion A1  
*If  $h = kt^2$  the first one tested (correctly) then award A2*

Test a second law to reach a correct conclusion A1

Select  $h = kt^2$  A1  
*Conclusion must be stated  
 No working ... no marks*

[4]