

Direct and Inverse Proportion Mark Scheme												
1(a)	$y = kx$	[1] Correct proportionality equation										
	$36 = 4k \text{ so } k = 9$	[1] Value of k										
	$y = 9x$	[1] Correct final equation										
1(b)	$y = 9 \times 3 = 27$	[1] Substitute $x = 3$ into the eq. from (a)										
1(a)	$y = kx^2$	[1] Correct proportionality equation										
	$36 = 4k, k = 9$	[1] Value of k										
	$y = 9x^2$	[1] Correct final equation										
2(b)	$x = \frac{7}{3}$	[1] Substitute $y = 49$ into the eq. from (a)										
3(a)	$d = kc$	[1] Correct proportionality equation										
	$12 = 3c \text{ so } k = 4$	[1] Value of k										
	$d = 4c$	[1] Correct final equation										
3(b)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>c</td> <td>3</td> <td>5</td> <td>7</td> <td>12</td> </tr> <tr> <td>d</td> <td>12</td> <td>20</td> <td>28</td> <td>48</td> </tr> </tbody> </table>	c	3	5	7	12	d	12	20	28	48	[1] $c = 7$ [1] $d = 20$ [1] $d = 48$
c	3	5	7	12								
d	12	20	28	48								
4(a)	$y = \frac{k}{x}, \quad 4 = \frac{k}{7}$	[1] Correct proportionality equation										
	$k = 28$	[1] Value of k										
	$\text{So } y = \frac{28}{x}$	[1] Correct final equation										
4(b)	$2 = \frac{28}{x}, \quad x = 14$	[1] Substitute $y = 2$ into the eq. from (a)										
5(a)	$y = \frac{k}{x^2}$	[1] Correct proportionality equation										
	$3 = \frac{k}{4^2}, k = 48$	[1] Value of k										
	$y = \frac{48}{x^2}$	[1] Correct final equation										
5(b)	$y = \frac{48}{25}$	[1] Substitute $x = 5$ into the eq. from (a)										

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6(a)	$r \propto \frac{1}{x^2}, \quad r = \frac{k}{x^2}$	[1] Correct proportionality equation
	$(4) = \frac{k}{(4)^2}, k = 64$	[1] Value of k
	$r = \frac{64}{x^2}$	[1] Correct final equation
6(b)	$r = \frac{64}{(2)^2} = 16$	[1] Substitute $x = 2$ into the eq. from (a)
6(c)	$x^2 = \frac{64}{r} = \frac{64}{2}$	[1] Substitute $x = 2$ into the eq. from (a)
	$x = \sqrt{32} = 4\sqrt{2}$	[1] Correct value of x
7	$a = kb^2 \quad \text{and} \quad a = m\sqrt{c}$	[1] Correct proportionality equations using any letters for k and m .
	So $kb^2 = m\sqrt{c}$	[1] Equating the two equations
	So $b^2 = \frac{m}{k}\sqrt{c}$	[1] Rearranging
	So $b^2 \propto \sqrt{c}$, so $b^2 = g\sqrt{c}$	[1] Introducing new proportionality constant g
	$g = \frac{b^2}{\sqrt{c}} = \frac{4.5^2}{\sqrt{2.25}} = 13.5$	[1] Finding g
	$b^2 = 13.5\sqrt{8}$; $b = 6.18$	[1] Correct value of b to 3 s.f.

END