

Direct and Inverse Proportion Mark Scheme														
1(a)	$y = kx$			[1] Correct proportionality equation										
	$36 = 4k$ 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)										
2(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										
	$12 = 3c$ so $k = 4$			[1] Value of k										
	$d = 4c$			[1] Correct final equation										
3(b)	<table border="1"><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></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										
	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)										
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										

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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 .
	$\text{So} \quad kb^2 = m\sqrt{c}$	[1] Equating the two equations
	$\text{So} \quad b^2 = \frac{m}{k}\sqrt{c}$	[1] Rearranging
	$\text{So} \quad b^2 \propto \sqrt{c}, \text{ so } b^2 = g\sqrt{c}$	[1] Introducing new proportionality constant
	$g = \frac{b^2}{\sqrt{c}} = \frac{4.5^2}{\sqrt{2.25}} = 13.5$	[1] Finding (g)
	$b^2 = 13.5\sqrt{8} ; b = 6.18$	[1] Correct value of b to 3 s.f.

END