CHAPTER 5

<u>Ex A</u>

1) $x = \dfrac{y+1}{7}$ 2) $x = 4y - 5$ 3) $x = 3(4y + 2)$ 4) $x = \dfrac{9y + 20}{12}$

<u>Ex B</u>

1) $t = \dfrac{32rP}{w}$ 2) $t = \pm\sqrt{\dfrac{32rP}{w}}$ 3) $t = \pm\sqrt{\dfrac{3V}{\pi h}}$ 4) $t = \dfrac{P^2 g}{2}$ 5) $t = v - \dfrac{Pag}{w}$ 6)

$t = \pm\sqrt{\dfrac{r - a}{b}}$

<u>Ex C</u>

1) $x = \dfrac{c - 3}{a - b}$ 2) $x = \dfrac{3a + 2k}{k - 3}$ 3) $x = \dfrac{2y + 3}{5y - 2}$ 4) $x = \dfrac{ab}{b - a}$

CHALLENGE QUESTIONS
Question 1

$h = \sqrt{\dfrac{S^2 - 4\pi^2 d^4}{4\pi^2 d^2}}$

$\dfrac{S}{2\pi d} = \sqrt{h^2 + d^2}$

$\left(\dfrac{S}{2\pi d}\right)^2 = h^2 + d^2$

$h = \sqrt{\dfrac{S^2 - 4\pi^2 d}{4\pi^2 d^2}}$	3	M1 for correctly isolating $\sqrt{h^2 + d^2}$ or $h^2 + d^2$ or $h + d$ or kh^2 or kh M1(indep) squaring both sides A1 $h = \sqrt{\dfrac{S^2 - 4\pi^2 d^4}{4\pi^2 d^2}}$, $h = \dfrac{\sqrt{S^2 - 4\pi^2 d^4}}{2\pi d}$ $h = \sqrt{\left(\dfrac{S}{2\pi d}\right)^2 - d^2}$

Question 2

$y = \dfrac{x^4}{16a^3} - \dfrac{x^2}{2a}$

$\sqrt{t} = \dfrac{x}{2a}$ or $x^2 = (2a\sqrt{t})^2$ or

$x^4 = (2a\sqrt{t})^4$ oe

$t = \left(\dfrac{x}{2a}\right)^2$ oe or $t^2 = \dfrac{x^4}{16a^4}$ oe

$y = a\left[\left(\dfrac{x}{2a}\right)^2\right]^2 - 2a\left(\dfrac{x}{2a}\right)^2$ oe

		4	M1 Correct rearrangement for $\sqrt{t}$ or correct expression for x^2 or x^4
			M1 Correct expressions for t or t^2 or for at^2 or $2at$ in terms of x and a
			M1 For correct substitution of t and t^2 into expression for y
	$y = \dfrac{x^4}{16a^3} - \dfrac{x^2}{2a}$		A1 Fully correct answer in required form

Question 3

$q = \dfrac{p - 1}{1 - 2p}$

Question 4

$x = \dfrac{\sqrt{y} - 1}{\sqrt{y}}$

Question 5

$x = y + 1$

Question 6

$y = \dfrac{3x(x+4)}{3x+4}$

$\dfrac{y(x+4)}{x(x+4)} + \dfrac{2xy}{x(x+4)} = 3$ **or** $\dfrac{y(x+4)}{x(x+4)} + \dfrac{2xy}{x(x+4)} = \dfrac{3x(x+4)}{x(x+4)}$		5	M1	LHS may be two separate fractions or one single fraction (brackets may or may not be removed on RHS and denominator)
$y(x+4) + 2xy = 3x(x+4)$ **or** $\dfrac{xy+4y}{x(x+4)} + \dfrac{2xy}{x(x+4)} = 3$ **or** $\dfrac{xy+4y}{x(x+4)} + \dfrac{2xy}{x(x+4)} = \dfrac{3x(x+4)}{x(x+4)}$			M1	LHS may be two separate fractions or one single fraction; if one fraction, numerator on LHS may or may not be simplified **(implies previous M1)** (brackets may or may not be removed on RHS and denominator)
$xy+4y+2xy = 3x^2 +12x$ **or** $xy+4y\_2xy = 3x(x+4)$ **or** $3xy+4y = 3x^2 +12x$ **or** $3xy+4y = 3x(x+4)$			M1	(brackets may or may not be removed on RHS) **(implies previous two M1s)**
$y(3x+4) = 3x(x+4)$ **or** $y(3x+4) = 3x^2 +12x$			M1	LHS factorised correctly - expression in bracket on LHS may or may not be simplified
	$\dfrac{3x(x+4)}{3x+4}$		A1	$\dfrac{3x(x+4)}{3x+4}$ or $\dfrac{3x^2 +12x}{3x+4}$ a fully correct method must be seen in order to award full marks