

Answer Key

1	(a) $6p^2 + pq - 35q^2$	(b) $18m^2 - 48m + 32$	(c) $x^4 - 16$
2	(a) $(2m - n)(m + 3n)$	(b) $(p - q)(x - y)$	
3	$(a) (2p - 3q^2) - (p + q)^2$ $= (2p - 3q^2) - (p^2 + 2pq + q^2)$ $= 2p - 3q^2 - p^2 - 2pq - q^2$ $= 2p - 4q^2 - p^2 - 2pq$	$(b) 2x^3 - 50x$ $= 2x(x^2 - 25)$ $= 2x(x + 5)(x - 5)$	$(c) 4(x - y)^2 = 328$ $(x - y)^2 = 82$ $x^2 - 2xy + y^2 = 82$ $x^2 + y^2 - 2(24) = 82$ $x^2 + y^2 = 130$ $3x^2 + 3y^2 = 390$
4	$(a) a = \sqrt{\frac{2b+1}{b}}$ $a^2 = \frac{2b+1}{b}$ $a^2b = 2b + 1$ $a^2b - 2b = 1$ $b(a^2 - 2) = 1$ $b = \frac{1}{a^2-2}$	$(b) \frac{5}{x-4} = \frac{5x-3}{x^2-2}$ $5(x^2 - 2) = (x - 4)(5x - 3)$ $5x^2 - 10 = 5x^2 - 3x - 20x + 12$ $5x^2 - 5x^2 + 23x = 12 + 10$ $23x = 22$ $x = \frac{22}{23}$	
5	$(2x - 3y = 12 \dots (1)$ $(1) \times 2:$ $4x - 6y = 24 \dots (2)$ $4x + 5y = -9 \dots (3)$ $(2) - (3):$ $4x - 6y - (4x + 5y) = 24 - (-9) \dots \dots \text{M1 (substitution or elimination)}$ $4x - 6y - 4x - 5y = 33$ $-11y = 33$ $y = -3$ $x = 1.5$		
6	$\frac{5x+6}{2x^2-x-6} - \frac{2}{x-2} = \frac{5x+6}{(2x+3)(x-2)} - \frac{2}{x-2}$ $= \frac{5x+6}{(2x+3)(x-2)} - \frac{4x+6}{(2x+3)(x-2)}$ $= \frac{5x+6-4x-6}{(3x+3)(x-2)}$ $= \frac{x}{(3x+3)(x-2)}$		

7	(a) $\frac{2a^2}{5bc} \div \frac{14a}{15c}$ $\frac{2a^2}{5bc} \times \frac{15c}{14a}$ $= \frac{3a}{7b}$	(b) $\frac{36}{2p-14q} \times \frac{p^2-49q^2}{3}$ $= \frac{36}{2(p-7q)} \times \frac{(p+7q)(p-7q)}{3}$ $= 6(p+7q)$ $= 6p + 42q$
8	(a) (i) $\frac{120}{x}$ (ii) $\frac{115}{x-2}$ (c) $x = \frac{-11 \pm \sqrt{11^2 - 4(2)(-720)}}{2(2)}$ $x = 16.42192, -21.92192$ $x = 16.422, -21.922$ (3dp)	(b) $\frac{115}{x-2} - \frac{120}{x} = \frac{2}{3}$ $115(3)(x) - 120(3)(x-2) = 2(x)(x-2)$ $345x - 360x + 720 = 2x^2 - 4x$ $-15x + 720 = 2x^2 - 4x$ $2x^2 - 4x + 15x - 720 = 0$ (d) $\frac{115}{16.42192-2}$ $= 7.97397 h$ $= 7h 58 min$
9	(a) $16 + 4k - 28 = 0$ $k = 3$	(b) $x^2 + 3x - 28 = 0$ $(x-4)(x+7) = 0$ $x = -7$