

## 4th Year Quadratics & Algebra Re-Test Practice Sheet

### 1. Factorise

(a)  $3x^2 + 9x - 12.$

$$3(x-1)(x+4)$$

(b)  $7x^2 - 14x + 7.$

$$7(x-1)^2$$

(c)  $32x^2 - 8x.$

$$8x(4x-1)$$

(d)  $18x^2 - 2.$

$$2(3x+1)(3x-1)$$

(e)  $2px + 2py + qx + qy.$

$$(2p+q)(x+y)$$

(f)  $10xp + 5xq + 4py + 2qy.$

$$(5x+2y)(2p+q)$$

(g)  $12x^2 + 2x - 4.$

$$2(2x-1)(3x+2)$$

(h)  $30x^2 - 10x - 100.$

$$10(3x+5)(x-2)$$

2. Make  $x$  the subject in  $\frac{x+a}{x-b} = \frac{c}{d}.$

$$x = \frac{ad+bc}{c-d}$$

3. Make  $x$  the subject in  $c\sqrt{a + \sqrt{b - \sqrt{x - e}}} = d.$

$$x = e + \left( b - \left( \left( \frac{d}{c} \right)^2 - a \right)^2 \right)^2$$

4. Find the equation of the line through  $(4, -2)$  and  $(7, -2).$

$$y = -2$$

5. Find the equation of the line through  $(3, 1)$  which is parallel to  $3x - 2y = 7.$  □

6. Find where the line  $5x + 2y = 60$  crosses the  $x$  and  $y$ -axes.

$$(0, 30) \text{ and } (12, 0)$$

### 7. Solve the following equations:

(a)  $(x-7)(2x+1) = 0.$

$$x = 7 \text{ or } x = -\frac{1}{2}$$

(b)  $x(2x-3)(5x-4)(6x+1) = 0.$

$$x = 0, x = 3/2, x = 4/5, x = -1/6$$

(c)  $36x^2 = 27x + 9.$

$$x = 1, x = \dots$$

(d)  $30x^2 = 10x + 140.$

$$x = -2, x = \dots$$

(e)  $4x^2 = x.$

$$x = 0, x = \frac{1}{4}$$

(f)  $(2x+1)^2 = (x+3)^2.$

$$x = 2, x = \dots$$

### 8. Solve the following sets of simultaneous equations:

(a)  $\begin{cases} 3x - 4y = 6 \\ x - 3y = 7 \end{cases}$

$$x = -2, y = -3$$

(b)  $\begin{cases} y = 2x + 2 \\ 4x^2 + y^2 = 10 \end{cases}$

$$(x, y) = \left(\frac{1}{2}, 3\right) \text{ or } (x, y) = \left(-\frac{3}{2}, -1\right)$$