

## 5th Review Worksheet

Patrons are kindly reminded that the three stages for factorising *anything* are up on my wall. Also *anything* crosses the  $y$ -axis when  $x = 0$  and *anything* crosses the  $x$ -axis when  $y = 0$ .

1. Factorise the following expressions:

(a)  $4x^2 - 36x$ .

$4x(x - 9)$

(b)  $4x^2 - 36$ .

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

(c)  $2x^2 + 8x - 24$ .

$2(x + 6)(x - 2)$

(d)  $3ax^2 - ax - 10a$ .

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

2. Solve the following equations:

(a)  $\frac{x - 1}{2} - \frac{2x + 1}{3} = x$ .

$x = -\frac{5}{7}$

(b)  $\frac{x}{4} - \frac{1 - x}{2} = 2 - x$ .

$x = \frac{10}{7}$

(c)  $(x + 1)^2 + (x + 2)^2 = 1$ .

$x = -1$  or  $x = -2$

(d)  $\frac{8}{x - 2} = 2x - 4$ .

$x = 0$  or  $x = 4$

3. Solve the following inequalities:

(a)  $3(x - 2) > x - 4$ .

$x > 1$

(b)  $\frac{2x - 7}{-3} < x + 2$ .

$x > \frac{1}{5}$

(c)  $x^2 \geq 36$ .

$x \leq -6$  or  $x \geq 6$

(d)  $(x + 2)(x - 3) < 0$ .

$-2 < x < 3$

(e)  $x^2 + 15 > 8x$ .

$x < 3$  or  $x > 5$

(f)  $4x^2 - 4x < 15$ .

$-\frac{3}{2} < x < \frac{5}{2}$

4. Sketch the following quadratics:

(a)  $y = (x - 1)(x + 3)$ .

happy through  $(0, -3)$ ,  $(1, 0)$  and  $(-3, 0)$

(b)  $y = (x + 4)(x - 2)$ .

happy through  $(0, -8)$ ,  $(-4, 0)$  and  $(2, 0)$

(c)  $y = (2 - x)(x + 3)$ .

sad through  $(0, 6)$ ,  $(2, 0)$  and  $(-3, 0)$

(d)  $y = x^2 - x - 2$ .

happy through  $(0, -2)$ ,  $(2, 0)$  and  $(-1, 0)$

(e)  $y = 2x^2 + x - 10$ .

happy through  $(0, -10)$ ,  $(2, 0)$  and  $(-\frac{5}{2}, 0)$

(f)  $y = -3x^2 + 13x - 4$ .

sad through  $(0, -4)$ ,  $(4, 0)$  and  $(\frac{1}{3}, 0)$

5. Find an expression for the  $n$ th term of the following and use it to find the 100th term in the sequence:

(a) 10, 14, 18, 22, 26.

$T = 4n + 6$  and 406

(b) 0.7, 0.5, 0.3, 0.1.

$T = -0.2n + 0.9$  and  $-19.1$

(c) 3, 11, 21, 33, 47

$T = n^2 + 5n - 3$  and 10497

6. In McDonalds one can buy Chicken McNuggets in boxes of 6, boxes of 9 and boxes of 20. What is the largest number one cannot buy? [For example, I can buy 15, but I can't buy 14.]