Firrhill High School

Mathematics Department

Level 5

Assessment Questions

# Algebra

# Factorising

(1) 2009 Paper 1 Q.4

(*a*) Factorise

$$x^2 - 4y^2.$$

**1**

(*b*) Expand and simplify

$$(2x - 1)(x + 4).$$

**1**

(*c*) Expand

$$x^{\frac{1}{2}}\left(3x + x^{-2}\right).$$

**2**

(2) 2008 Paper 1 Q.2

Factorise fully

$$5x^2 - 45.$$

**2**

(3) 2006 Paper 1 Q.6

| KU | RE |
|---|---|

(*a*) Factorise

$$4x^2 - y^2.$$

**1**

(*b*) Hence simplify

$$\frac{4x^2 - y^2}{6x + 3y}.$$

**2**

(4) 2003 Paper 1 Q.5

Factorise

$$2x^2 - 7x - 15.$$

**2**

(5) 2002 Paper 1 Q.5

(*a*) Factorise $p^2 - 4q^2$. 1

(*b*) Hence simplify

$$\frac{p^2 - 4q^2}{3p + 6q}.$$ 2

(6) 2000 Paper 1 Q.4

(*a*) Factorise $x^2 - 16$. 1

(*b*) Express $\frac{5(2x-3)}{4x^2 - 9}$ in its simplest form. 2

(7) 1999 Paper 1 Q.4

Factorise $3x^2 - 5x - 2$. 2

8) 2014 N5 Paper 1

3. Express $x^2 - 14x + 44$ in the form $(x-a)^2 + b$. 2

9) 2014 Int2 Paper 2

3. Factorise **fully**

$3x^2 + 9x - 12$. 3

10) 2014 Int2 Paper 2

6. Solve the equation

$2x^2 - 7x + 1 = 0,$

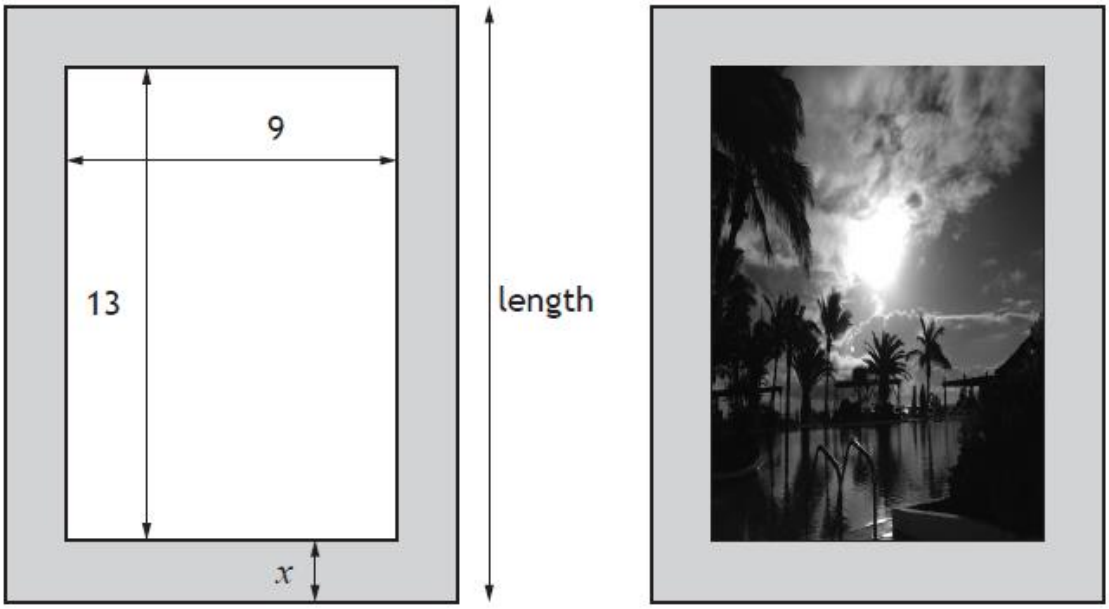
giving the answers correct to two decimal places. 4

11) 2015 N5 Paper 2

14. A rectangular picture measuring 9 centimetres by 13 centimetres is placed on a rectangular piece of card.

The area of the card is 270 square centimetres.

There is a border $x$ centimetres wide on all sides of the picture.




(a) (i) Write down an expression for the length of the card in terms of $x$. 1

(ii) Hence show that $4x^2 + 44x - 153 = 0$. 2

(b) Calculate $x$, the width of the border.

Give your answer correct to one decimal place. 4

12) 2013 Int 2 Paper 1

1. Factorise

$$6ab - 7bc.$$ 1

13) 2013 Int 2 Paper 2

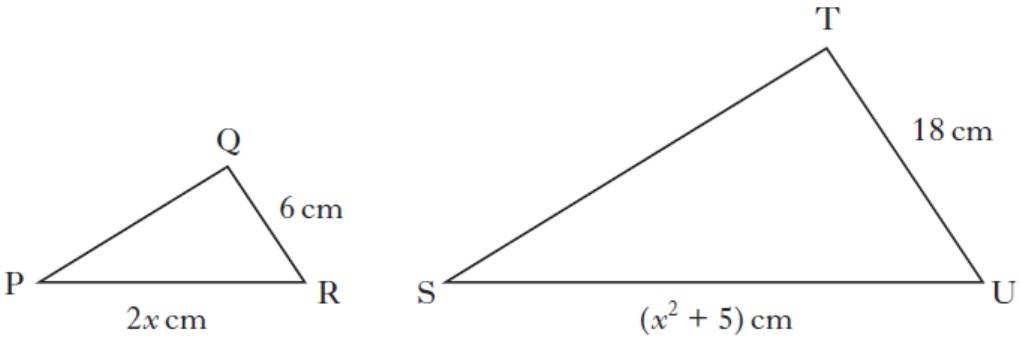
5. Solve the equation

$$x^2 - 5x - 2 = 0,$$

giving the roots correct to one decimal place. 4

14) 2012 Credit Paper 2

**13.** Triangles PQR and STU are mathematically similar.
The scale factor is 3 and PR corresponds to SU.




(*a*) Show that $x^2 - 6x + 5 = 0$. **2**

(*b*) Given QR is the shortest side of triangle PQR, find the value of $x$. **3**

15) 2012 Int 2 Paper 1

**8.** (*a*) Factorise

$$a^2 + 2ab + b^2.$$ **1**

(*b*) Hence, or otherwise, find the value of

$$94^2 + 2 \times 94 \times 6 + 6^2.$$ **2**

16) 2012 Int 2 Paper 2

**4.** Solve the equation *Marks*

$$3x^2 + 7x - 5 = 0,$$

giving the roots correct to one decimal place. **4**

17) 2011 Credit Paper 1

**2.** Factorise fully

$$2m^2 - 18.$$ **2**

18) 2011 Credit Paper 2

**3.** Solve the equation

$$2x^2 + 3x - 7 = 0.$$

Give your answers **correct to 2 significant figures**. **4**