

1. Simplify the following:  $4 \times 6 \times 1 = 24$

(i)  $x^4 \times x^6 \times x = x^{11}$   $x^4 \times x^6 \times x = x^{11}$

(ii)  $2x^2 \times 3x^3 \times 2x = 12x^6$

(iii)  $\frac{x^4 \times x^3 \times x^2}{x^9} = \frac{x^9}{x^9} = x^0 = 1$

(iv)  $(3x^2)^3 = 27x^6$

(v)  $\sqrt{x} \times \sqrt{x} = x$

(7 marks)

2. Solve the following linear equations for x:

(i)  $15x - 2 = 12x + 9$   $15x - 12x = 9 + 2$   $3x = 11$   $x = 3.66$

(ii)  $3(7x - 1) = 6(x + 3)$   $21x - 3 = 6x + 18$   $21x - 6x = 18 + 3$   $15x = 21$   $x = 1.4$

(iii)  $\frac{5x+3}{4} = \frac{2x-1}{9}$

(12 marks)

3. Solve the following quadratic equations by using the factorisation method:

(i)  $x^2 + 10x + 21 = 0$   $(x+3)(x+7) = 0$   $x = -3$  or  $x = -7$

(ii)  $x^2 - 3x + 2 = 0$   $(x-1)(x-2) = 0$   $x = 1$  or  $x = 2$

(iii)  $x^2 + 12x + 20 = 0$

(iv)  $x^2 - 64 = 0$   $x^2 = 64$   $x = \pm 8$

(v)  $2x^2 + 9x + 10 = 0$

(16 marks)

4. Use the formula  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  to find the two solutions of the following quadratic equation, giving your answers correct to two decimal places.

$$14x^2 + 3x = 11$$

(7 marks)

5. Solve the following simultaneous equations:

$$5x + 3y = 39$$

$$8x - 2y = 42$$

$$x = 6 \quad y = 3$$

(5 marks)

6. Simplify the following as far as possible:

$$5(2x^2 - y^2) - x^2(x^2 - y) - x^2y - x^4$$

$$10x^2 - 5y^2 - x^4 - x^2y - x^2y - x^4$$

(4 marks)

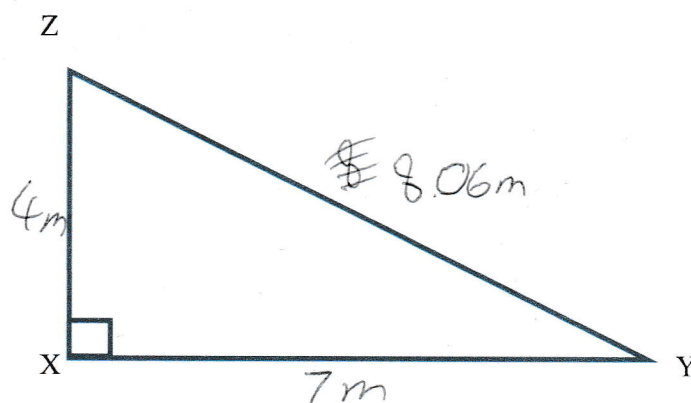
7.

In the following right-angled triangle, if XZ is 4 metres and XY is 7 metres, calculate:

(i) Angle Y  $29.7$

(ii) Angle Z  $60.3$

(iii) Length YZ using Pythagoras' theorem  $4^2 + 7^2 = 65 = 8.06^2$



(6 marks)

8. Express the following as  $x$  to a power:

(i)  $\sqrt[3]{x} = x^{1/3}$

(ii)  $1 = x^0$

(2 marks)

TOTAL MARKS: 59