

2005245

1. Simplify the following:

(i) $x^2 \times x^7 \times x$ x^{10}

(ii) $5x^2 \times x^2 \times 3x$ $15x^5$

(iii) $\frac{x^9 \times x^5 \times x^2}{x^3}$ x^{13}

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

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

(7 marks)

2. Solve the following linear equations for x :

(i) $12x - 10 = 8x + 15$ $x = 6.25$

(ii) $3(8x - 2) = 2(2x + 1)$ $x = 0.4$

(iii) $\frac{8x+1}{2} = \frac{5x+1}{3}$ $x = 2.9$

(12 marks)

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

(i) $x^2 + 10x + 25 = 0$ $x = -5$

(ii) $x^2 + 7x + 6 = 0$

(iii) $x^2 + 18x + 80 = 0$

(iv) $x^2 - 100 = 0$ $x = 10$

(v) $2x^2 + 3x + 1 = 0$

(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.

$$12x^2 + x - 15 = 0$$

(7 marks)

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5. Solve the following simultaneous equations:

$$2x + 3y = 13$$

$$4x + 2y = 22$$

$$x=5 \quad y=1$$

(5 marks)

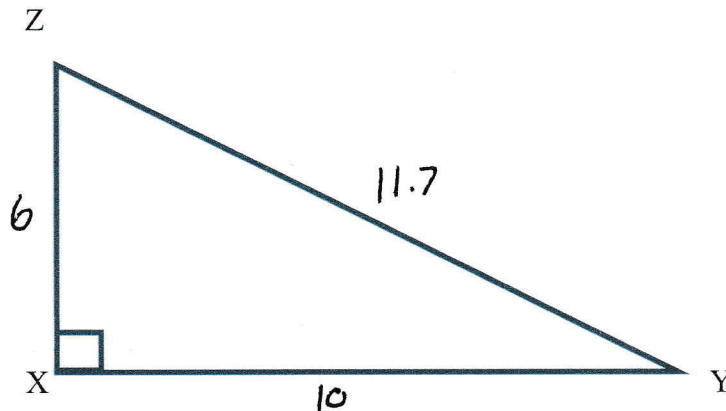
6.

In the following right-angled triangle, if XZ is 6 metres and XY is 10 metres, calculate:

(i) Angle Y 30.9°

(ii) Angle Z 59.1°

(iii) Length YZ using Pythagoras' theorem 11.7



(6 marks)

7. Express the following as x to a power:

(i) $\sqrt[5]{x}$

(ii) 1 $\times$

(2 marks)

TOTAL MARKS: 55

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Powers

$$x = x$$

$$x = x$$

$$x = x$$

1. Simplify

i) $x^2 \times x^7 \times x \rightarrow x^{2+7+1} = x^{10}$ added together $2+7+1=10$

ii) $5x^2 \times x^2 \times 3x$
 $x=15$

$$15x^4 \times x =$$

$$x = x^1$$

$$15x^4 \times x^1 = 15x^5$$

iii) $x^9 \times x^5 \times x^2$ $9+5+2=16$
 x^3

$$\frac{x^{16}}{x^3} = x^{13}$$

iv) $(3x^2)^3$

$$3^3 = 27 \quad (x^2)^3 = x^6 \quad 27x^6$$

iv) $\sqrt{x} \times x \times x$

2. solve for x

i) $12x - 10 = 8x + 15$

$$12x - 8x = 10 + 15$$

$$4x = 25$$

$$x = \frac{25}{4} = 6.25$$

ii) $3(8x - 2) = 2(2x + 1)$

$$24x - 6 = 4x + 2$$

$$24x - 4x = 6 + 2$$

$$20x = 8$$

$$20x = 8$$

$$x = \frac{2}{5} = 0.4$$

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2. solve for x (need some help)

$$\text{iii) } \frac{8x+1}{2} = \frac{5x+1}{3} = 3(8x+1) = 2(5x+1)$$

$$24x+3 = 10x+2$$

$$24x-10x \quad 3-2$$

$$14x \quad 1$$

$$x = \frac{1}{14} = 0.07$$

3. factoring quadratics (need help)

$$\text{i) } x^2 + 10x + 25 = 0$$

$$= (x+5)^2$$

$$(x+5)^2 = 0$$

$$x+5=0 \quad x=-5$$

$$\text{ii) } x^2 + 7x + 6 = 0$$

$$= (x+1)(x+6)$$

$$x^2 + 6x + x + 6 = 0 \quad x(x+6) + x+6 = 0 ?$$

factor out

$$\text{iii) } x^2 + 18x + 80 = 0 ?$$

$$\text{iv) } x^2 - 100 = 0$$

$$x = \sqrt{100} = 10$$

$$x = 10 \quad 10^2 - 100 = 0$$

$$\text{v) } 2x^2 + 3x + 1 = 0 ?$$

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Use $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ for quadratic equations

Need help understanding this topic

5. Simultaneous equations

$$\begin{aligned} 2x + 3y &= 13 \\ 4x + 2y &= 22 \end{aligned}$$

(trial and error)

$$2x = x \times 2 \quad 3y = y \times 3$$

$$2 + 3 = 5$$

$$4 + 3 = 7$$

$$6 + 3 = 9$$

$$8 + 3 = 11$$

$$10 + 3 = 13$$

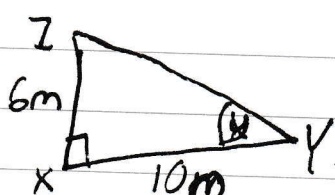
$$10 \div 2 = 5x \quad 3 \div 1 = 3$$

Is $x=5$ $y=1$ possible?

$$4x = 20 \quad 2y = 2$$
$$\underline{\quad 22 \quad}$$

$$x=5 \quad y=1$$

6.



$$XZ = 6m$$

$$XY = 10m$$

$$X = 90^\circ$$

$$i) \sin(\theta) = \frac{6}{11.7} = \sin(y) = \frac{6}{11.7} \quad \tan(y) = \frac{6}{10} = 30.9$$

$$ii) 180 - 90 - 30.9 = 59.1$$

$$iii) a^2 + b^2 = c^2 \quad 6^2 + 10^2 = 136 \quad \sqrt{136} = 11.7$$
$$YZ = 11.7$$

7.

i)

(ii) $1 = x$