

# MATHEMATICS



Topic: Solve equations using Exponential Laws

❖ In the term  $x^2$ ,  $x$  is the base and 2 is the exponent.  $x^2 = x \times x$ .

1. The exponent laws of multiplication.

$$x^4 \times x^2 = x^6$$

2. The exponent laws of division.  $x^4 \div x^2 = x^{4-2} = x^2$

3.  $(x^m)^n = a^{mn}$

4.  $(a \times m)^n = a^n \times m^n$

5.  $a^0 = 1$

6.  $a^1 = a$

# Worked Examples

1. Solve for X

$$x^2 + 3 = 28$$

$$x^2 = 25$$

$$x = 5 \text{ or } x = -5$$

Minus 3 both sides and find the square root from both sides

3.  $2^{2x} = 16$

$$2^{2x} = 2^4$$

$$2x = 4$$

$$x = 2$$

2. Solve for X

$$3^{4x+6} = 9$$

$$3^{4x+6} = 3^2$$

$$4x + 6 = 2$$

$$4x = 2 - 6$$

$$4x = -4$$

$$x = -1$$

Write 9 in an exponential form

Minus 6 from both sides

Divide by 4 both sides

# Exercise 9.4 pg 113

Solve all the following equations.

1.

22.

4.

25.

7.

28.

10.

31.

13.

34.

16.

19.