

N5 : Expressions and Formulas

Practice Test 1

Answer these questions

1. Simplify, giving your answer in surd form: $\sqrt{50}$

2. (a) Simplify: (i) $\frac{x^3 \times x^4}{x^2}$

(ii) $6x^3 \times 2x^{-3/2}$

(b) The distance from Earth to Venus (when they are closest) is 2.6×10^7 miles.

The distance from Earth to Jupiter (when they are closest) is 14 times as great as the distance from Earth to Venus.

Calculate the distance from Earth to Jupiter. Give your answer in scientific notation.

3. Expand and simplify where appropriate:

(a) $a(5a - b)$

(b) $(x + 4)(x + 5)$

4. Factorise:

(a) $x^2 - 8x$

(b) $y^2 - 36$

(c) $z^2 + 10z + 21$

5. Express $x^2 + 6x + 13$ in the form $(x + p)^2 + q$

6. Write $\frac{(2x - 3)(x + 4)}{(x + 4)^2}$ ($x \neq -4$)

in its simplest form.

7. Write each of the following as a single fraction:

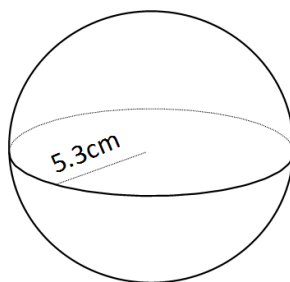
(a) $\frac{2}{a} - \frac{3}{b}$ $a, b \neq 0$

(b) $\frac{x}{2} \div \frac{y}{z}$ $y, z \neq 0$

8. Points A and B have coordinates $(-5, -2)$ and $(4, 3)$ respectively.

Calculate the gradient of AB.

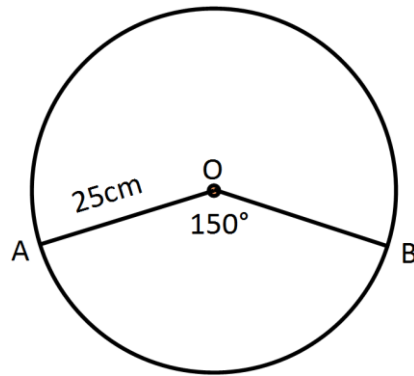
9. Calculate the volume of a sphere with radius 5.3 cm, giving your answer correct to two significant figures.



10. A shop supplies cardboard party hats like the one shown in the diagram below.



The hats are made by from circles of cardboard. A minor arc AB is drawn on the circle centre O. The radius OA is 25cm. Angle AOB is 150° .



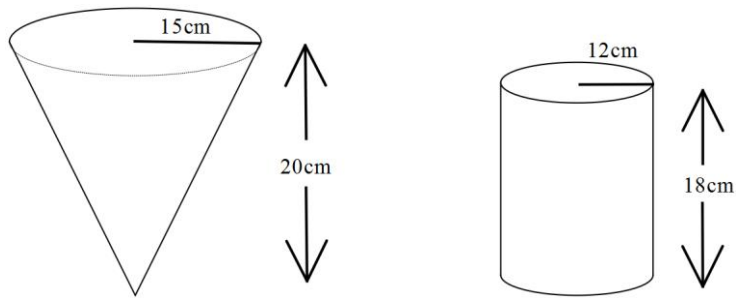
- (a) Calculate the length of the minor arc AB.

- (b) The shop wants to put tinsel around the base of the hats. They have 100m of tinsel in stock.

What is the maximum number of hats they can make from 100 metres?

11. A chemist's flask in the shape of a cone, has a radius of 15cm and a height of 20cm.

The flask is full of liquid.



The liquid is poured into a cylindrical beaker of radius 12cm and height 18cm.

Will the beaker hold the liquid or will it overflow?

End of Question Paper