

## N5 : Expressions and Formulas

### Practice Test 3

Answer these questions

1. Simplify, giving your answer in surd form:  $\sqrt{48}$

2. (a) Simplify: (i)  $\frac{x^2 \times x^6}{x^5}$

(ii)  $5x^2 \times 4x^{-3/2}$

(b) The distance from Earth to Mercury (when they are closest) is  $4.8 \times 10^7$  miles.

The distance from Earth to Neptune (when they are closest) is 56 times as great as the distance from Earth to Mercury.

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

3. Expand and simplify where appropriate:

(a)  $y(2x - y)$

(b)  $(x + 3)(x + 7)$

4. Factorise:

(a)  $12p - 3p^2$

(b)  $x^2 - 64$

(c)  $y^2 + 9y + 20$

5. Express  $x^2 - 4x + 1$  in the form  $(x + p)^2 + q$

6. Write  $\frac{(2x+1)(x-3)}{(x-3)^2}$  ( $x \neq 3$ )

in its simplest form.

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

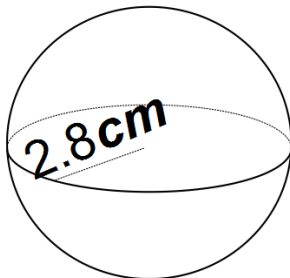
(a)  $\frac{4}{p} - \frac{5}{t}$   $p, t \neq 0$

(b)  $\frac{z}{3} \div \frac{x}{y}$   $x, y \neq 0$

8. Points D and F have coordinates  $(-6, -4)$  and  $(5, 2)$  respectively.

Calculate the gradient of DF.

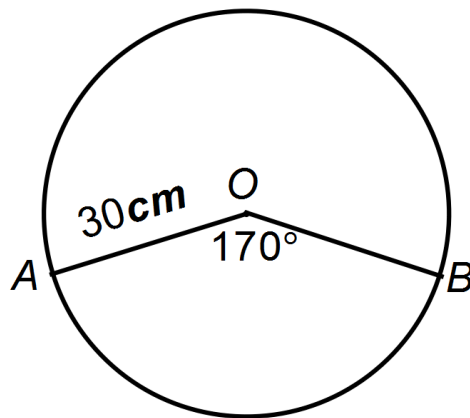
9. Calculate the volume of a sphere with radius 2.8 cm, giving your answer correct to two significant figures.



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 30cm. Angle AOB is  $170^\circ$ .

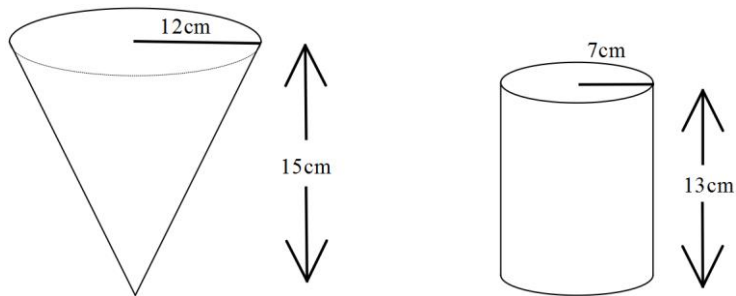


- (a) Calculate the length of the minor arc AB.
- (b) The shop wants to put tinsel around the base of the hats. They have 100m of tinsel in stock.

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 12cm and a height of 15cm.

The flask is full of liquid.



The liquid is poured into a cylindrical beaker of radius 7cm and height 13cm.

Will the beaker hold the liquid or will it overflow?

**End of Question Paper**