



Practice Paper A

Paper 1 – Non Calculator

Total Marks – 50

Attempt ALL questions.

**You may NOT use a calculator.**

Full credit will only be given to solutions which contain appropriate working.

State the units for your answers where appropriate

Write your answers clearly in the space provided in this booklet.

## FORMULAE LIST

The roots of  $ax^2 + bx + c = 0$  are  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Sine Rule:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule:  $a^2 = b^2 + c^2 - 2bc \cos A$  or  $\cos A = \frac{(b^2 + c^2 - a^2)}{2bc}$

Area of a triangle:  $A = \frac{1}{2}ab \sin C$

Volume of a sphere:  $V = \frac{4}{3}\pi r^3$

Volume of a cone:  $V = \frac{1}{3}\pi r^2 H$

Volume of a pyramid:  $V = \frac{1}{3}Ah$

Standard Deviation  $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}}$

or  $s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$ , where  $n$  is the sample size.

1. A function,  $f$ , is defined by  $f(x) = 2x^2 - 6$ .

Find  $f(-3)$

2

2. Expand and simplify

$$(2x + 1)(3x^2 - 2x + 1)$$

2

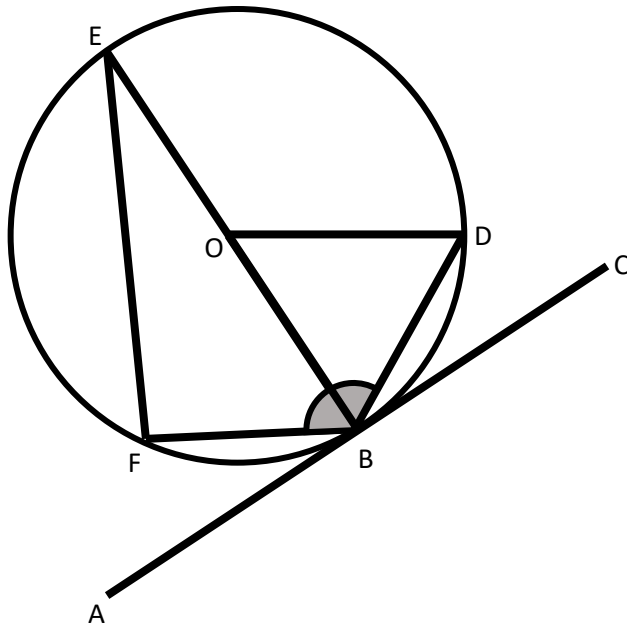
3. Evaluate

$$2\frac{5}{7}\left(\frac{8}{9} + \frac{2}{3}\right)$$

3

4. Find the size of the shaded angle ( $\angle FBD$ ) where

- $\angle DBC = 28^\circ$
- $\angle FEB = 17^\circ$
- $AC$  is a tangent to the circle.



5. A straight line is created by joining the points  $(4, 2)$  and  $(6, 20)$ .

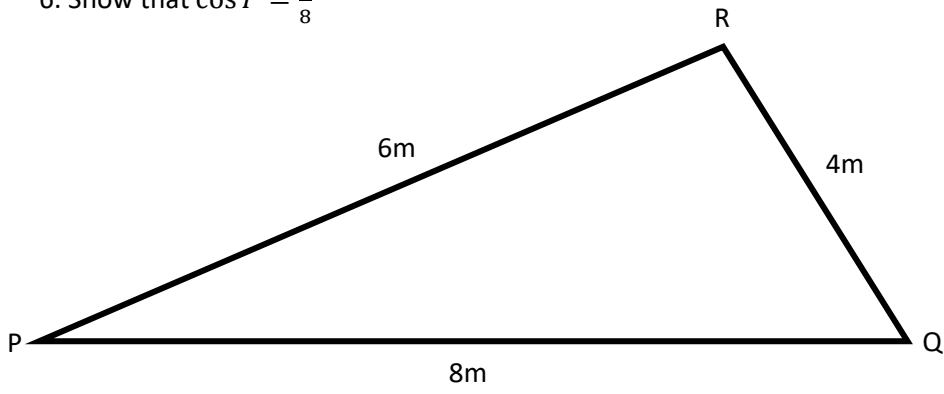
(a) Find the equation of this line.

3

(b) State the coordinate where this line crosses both sets of axis.

2

6. Show that  $\cos P = \frac{7}{8}$



7. The following ages of people who visited the doctors are noted below.

34, 72, 77, 9, 12, 16, 45, 80, 56, 54.

(a) State the median of this group

1

(b) Find the lower and upper quartiles

2

(c) Calculate the semi-interquartile range.

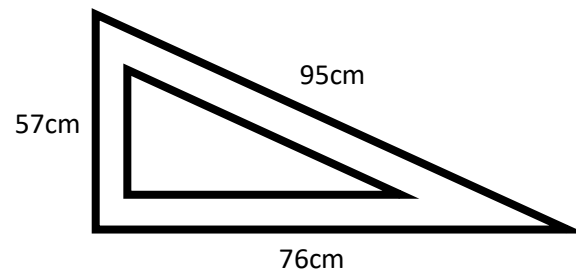
1

In another surgery the median age was 60 years old with a semi-interquartile range of 20.

(d) Write two statements comparing the two surgeries.

2

8. A 3D printer has printed a set square in as follows and is measured. Identify if this set square has a perfect right angle.



3

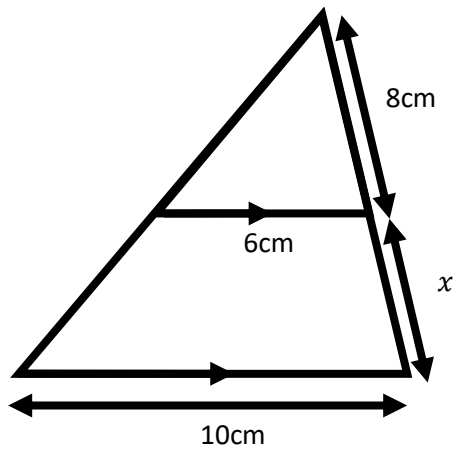
9. Write the following as a single fraction in its simplest form:

$$\frac{6}{x-3} + \frac{7}{(x-3)^2}, \quad x \neq 3$$

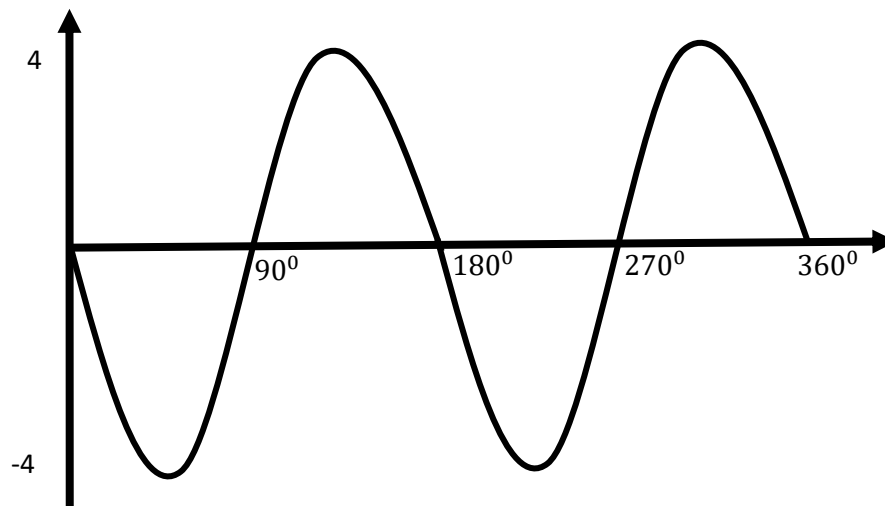
2



10. Find the length of  $x$ .



11. The graph below shows  $y = a \sin bx$ . State the values of  $a$  and  $b$ .



2

12. The roots of  $y = 2x^2 + 8x - 3$  are given by  $x = a \pm b\sqrt{c}$ . Find the values of  $a$ ,  $b$  and  $c$ .

4

13. (a) Evaluate

$$81^{\frac{5}{4}}$$

2

(b) Simplify fully, give your answer with a positive index:

$$\frac{(3x^3)^{-2}}{16x^2}$$

2

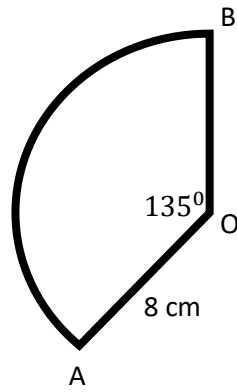
(c) Write the following as a single surd in its simplest form:

$$\sqrt{96} + 5\sqrt{6} - \sqrt{54}$$

2

14. Find the length of the arc AB

Take  $\pi = 3.14$



3

END OF PAPER