N5

Mαthematics

National 5 Practice Paper C

Paper 1

Duration – 1 hour

Total marks – 40

- o You may NOT use a calculator
- o Attempt all the questions.
- o Use **blue** or **black** ink.
- o Full credit will only be given to solutions which contain appropriate working.
- o State the units for your answer where appropriate.

FORMULAE LIST

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

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

Cosine rule:
$$a^2 = b^2 + c^2 - 2bc \cos A \quad \text{or} \quad \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

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

1. Evaluate   5.04 + 8.4 ÷ 7.   **2**

2. Evaluate $\dfrac{2}{7}\left(1\dfrac{3}{4}+\dfrac{3}{8}\right).$ **2**

3. Simplify $3(2x-4)-4(3x+1)$ **3**

4. $f(x)=7-4x$

    (a)   Evaluate $f(-2)$.   **1**

    (b)   Given that $f(t)=9$, find t.   **2**

5. Solve, by factorising

$$7+6x-x^2=0.$$ **3**

6. A hotel books taxis from a company called Quick-Cars.
The receptionist notes the waiting time for every taxi ordered over a period of two weeks. These times, in minutes, are shown below.

| 12	25	29	37	6	13	26
32	42	7	14	29	35	44

(a) For the given data, calculate:

    (i)   the median   1

    (ii)   the lower quartile   1

    (iii)   the upper quartile   1

(b) Calculate the interquartile range.   1

In another two week period, the hotel books taxis from a company called Fast-Cabs.

The median waiting time for Fast-Cabs is found to be 27.5 minutes and the interquartile range for Fast-Cabs is found to be 5 minutes.
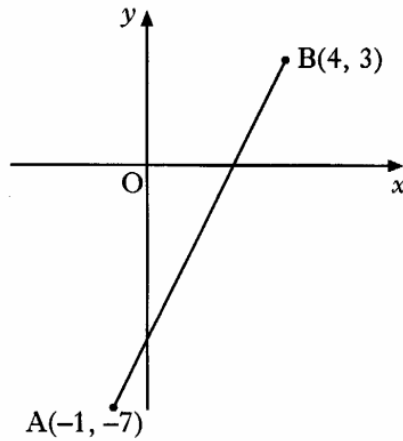
(c) Use this information to compare the two companies.   2

7. Part of the graph of $y = a\sin(x + b)°$ is shown in the diagram.
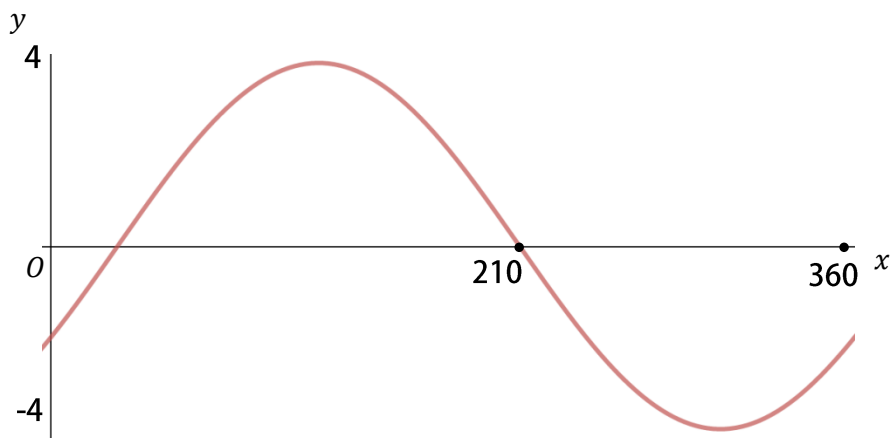
State the values of a and b.   2

8.   In the diagram below, A is the point $(-1, -7)$ and B is the point $(4,3)$.

(a)   Find the gradient of the line AB.   1

(b)   AB cuts the y-axis at the point $(0, -5)$.
       Write down the equation of the line AB.   2

(c)   The point $(3k, k)$ lies on AB. Find the value of k.   2

9. $$f(x) = x^2 + 6x - 7$$

(a)   Write $f(x)$ in the form $(x + a)^2 + b$.   2

(b)   State the coordinates of the turning point of $f(x)$.   1

10. Andrew and Daisy each book in at the Sleepwell Lodge.

   (a) Andrew stays for 3 nights and has breakfast on 2 mornings.
   His bill is £145.
   Write down an algebraic equation to illustrate this information.   1

   (b) Daisy stays for 5 nights and has breakfast on 3 mornings.
   Her bill is £240.
   Write down an algebraic equation to illustrate this information.   1

   (c) Find the cost of one breakfast   3

11. (a) Evaluate $8^{\frac{2}{3}}$ 2

   (b) Simplify $\dfrac{\sqrt{24}}{\sqrt{2}}$ 2

   (c) Simplify $\dfrac{2x + 2}{(x + 1)^2}$ 2

[End of question paper]