Dr Oliver Mathematics
Mathematics: National Qualifications N5
2015 Paper 1: Non-Calculator
1 hour

The total number of marks available is 40.
You must write down all the stages in your working.

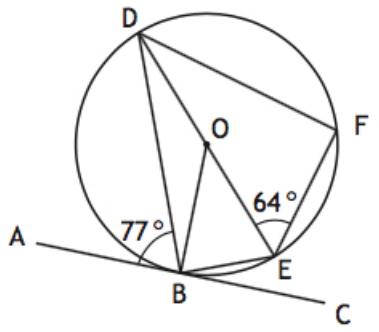
1. Evaluate (2)

$$6\tfrac{1}{5} - 2\tfrac{1}{3}.$$

2. Solve algebraically the inequality (3)

$$11 - 2(1 + 3x) < 39.$$

3. AC is a tangent to the circle, centre O, with point of contact B. (3)
DE is a diameter of the circle and F is a point on the circumference.
Angle ABD is $77°$ and angle DEF is $64°$.



Calculate the size of angle BDF.

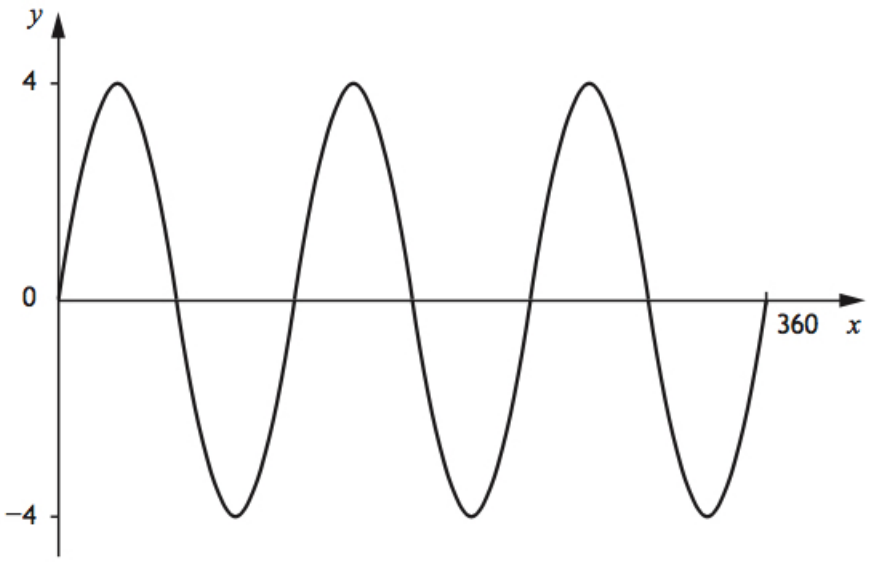
4. Multiply out the brackets and collect like terms (3)

$$(x - 4)(x^2 + x - 2).$$

5. The standard deviation of 1, 2, 2, 2, and 8 is equal to $\sqrt{a}$. (3)

Find the value of a.

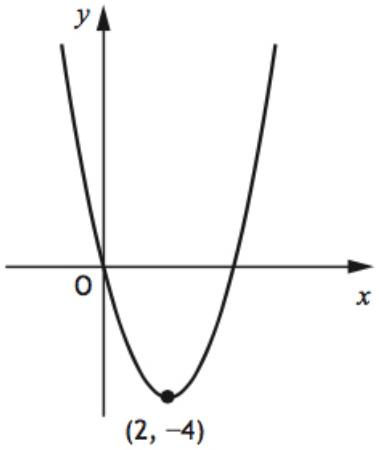
6. Part of the graph of $y = a \sin bx^\circ$ is shown in the diagram. (2)



State the values of a and b.

7. The graph below shows part of the parabola with equation of the form

$$y = (x + a)^2 + b.$$



The minimum turning point $(2, -4)$ is shown in the diagram.

(a) State the values of

(i) a, (1)

(ii) b. (1)

(b) Write down the equation of the axis of symmetry of the graph. (1)

8. Find the equation of the line joining the points $(-2, 5)$ and $(3, 15)$. (3)

Give the equation in its simplest form.

9. Write the following in order of size starting with the smallest. (2)

$$\cos 90^\circ \quad \cos 100^\circ \quad \cos 300^\circ.$$

Justify your answer.

10. Ten couples took part in a dance competition.
The couples were given a score in each round.
The scores in the first round were

16 27 12 18 26 21 27 22 18 17

(a) Calculate the median and semi-interquartile range of these scores. (3)

In the second round, the median was 26 and the semi-interquartile range was 2.5.

(b) Make two valid comparisons between the scores in the first and second rounds. (2)

11. Solve algebraically the system of equations (3)

$$3x + 2y = 17$$
$$2x + 5y = 4.$$

12. Simplify (3)

$$\frac{x^2 - 4x}{x^2 + x - 20}.$$

13. Express (3)

$$\frac{4}{\sqrt{8}}$$

with a rational denominator.
Give your answer in its simplest form.

14. Evaluate (2)

$$8^{\frac{5}{3}}.$$