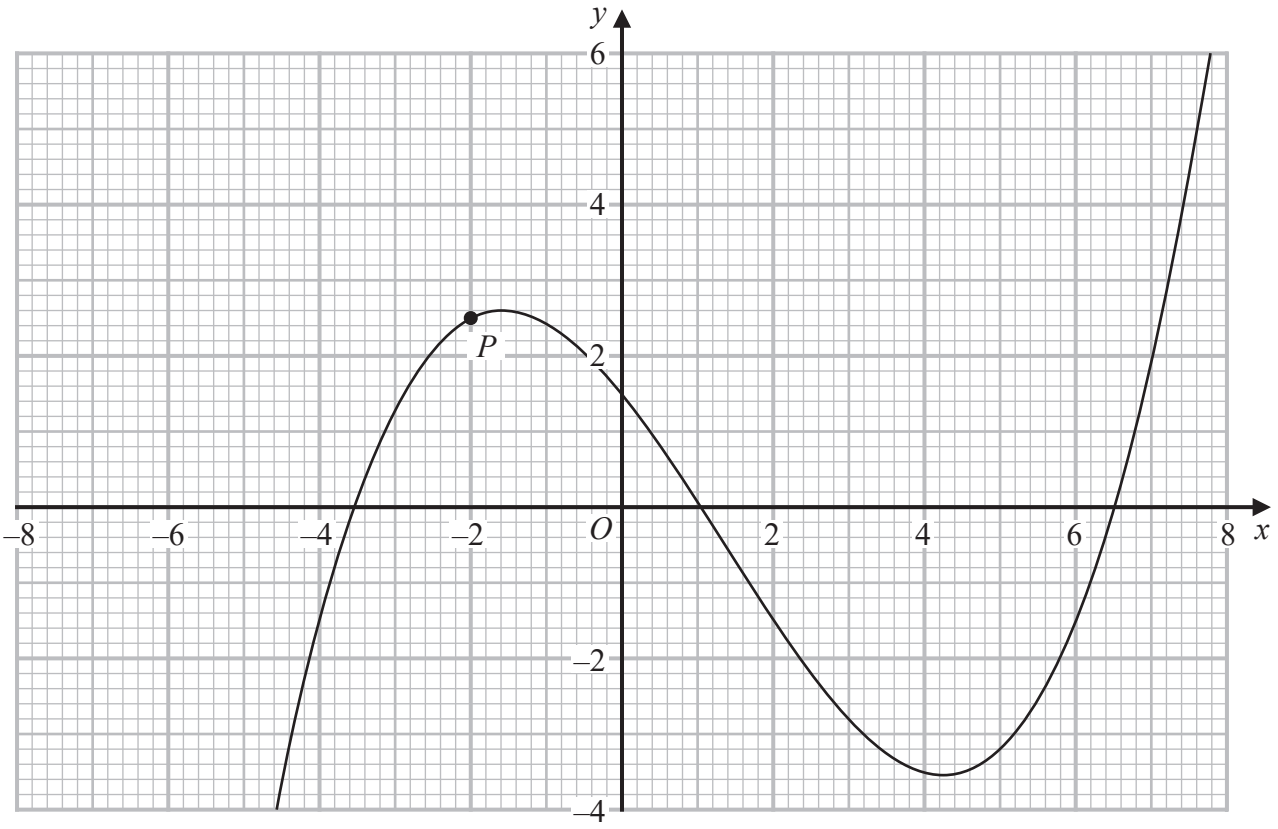
21 The diagram shows the graph of $y = f(x)$



The point P has x coordinate -2

Use the graph to find an estimate for the gradient of the curve at P

.....

(Total for Question 21 is 3 marks)

22 Solve the simultaneous equations

$$2y^2 + x^2 = -6x + 42$$
$$2x + y = -3$$

Show clear algebraic working.

.....

(Total for Question 22 is 5 marks)

23 *AEC* and *BED* are chords of a circle.

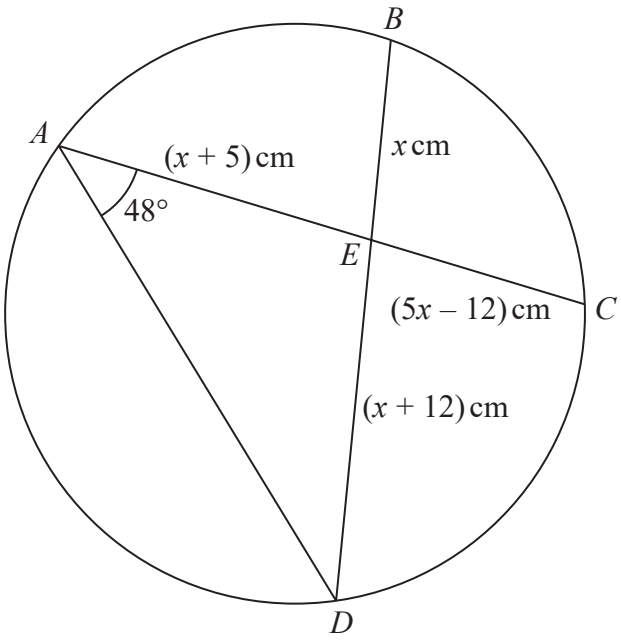


Diagram **NOT** accurately drawn

$AE = (x + 5)$ cm $BE = x$ cm $CE = (5x - 12)$ cm $DE = (x + 12)$ cm

Angle $DAE = 48°$

Work out the size of angle ADE
Give your answer correct to one decimal place.

DO NOT WRITE IN THIS AREA

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(Total for Question 23 is 5 marks)

Turn over for Question 24

24 The diagram shows a solid cone and a solid sphere.

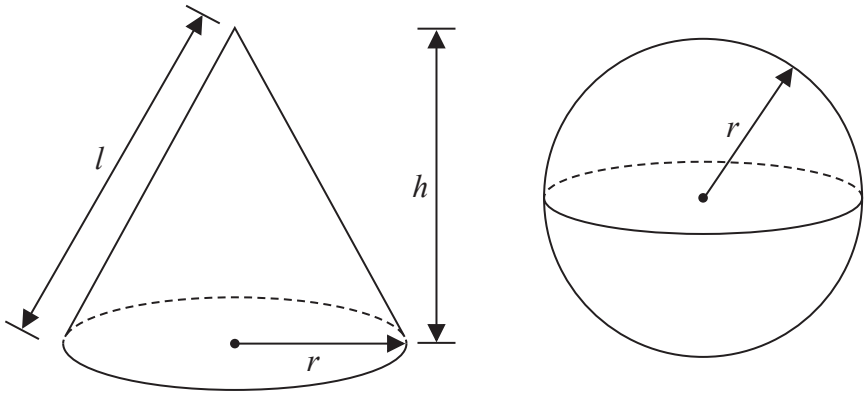

Diagram **NOT** accurately drawn

The cone has base radius r, slant height l and perpendicular height h
The sphere has radius r

The base radius of the cone is equal to the radius of the sphere.

Given that

$$k \times \text{volume of the cone} = \text{volume of the sphere}$$

show that the **total** surface area of the cone can be written in the form

$$\pi r^2 \left(\frac{k + \sqrt{k^2 + a}}{k} \right)$$

where a is a constant to be found.

(Total for Question 24 is 6 marks)

Turn over for Question 25

25 *ABCD* is a trapezium with *AB* parallel to *DC*

A is the point with coordinates (–4, 6)
B is the point with coordinates (2, 3)
D is the point with coordinates (–1, 8)

The trapezium has one line of symmetry.
The line of symmetry intersects *CD* at the point *E*

Work out the coordinates of the point *E*

(..... , ...)

(Total for Question 25 is 6 marks)

Turn over for Question 26

26 Write

$$\frac{4x^2 - 17x - 15}{2x - 1} \times \frac{2x^2 - 7x + 3}{x^2 - 25} + (29 - 4x)$$

as a single fraction in its simplest form.

.....

(Total for Question 26 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS