Mixed Exercise 3

1.

(a) Simplify $(16y^8)^{\frac{3}{4}}$

.....

(b) Given that $2^p \times 8^q = 2^n$

express n in terms of p and q.

$n =$ .....

2.

(a) Simplify $(3a^2b)^4$

.....

(b) Simplify $(9c^8)^{\frac{1}{2}}$

.....

3.

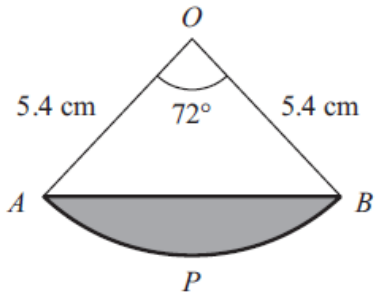


Diagram **NOT** accurately drawn

The diagram shows a sector $OAPB$ of a circle, centre O.
AB is a chord of the circle.
$OA = OB = 5.4$ cm.
Angle $AOB = 72°$

Calculate the area of the shaded segment APB.
Give your answer correct to 3 significant figures.

..... cm^2

4.

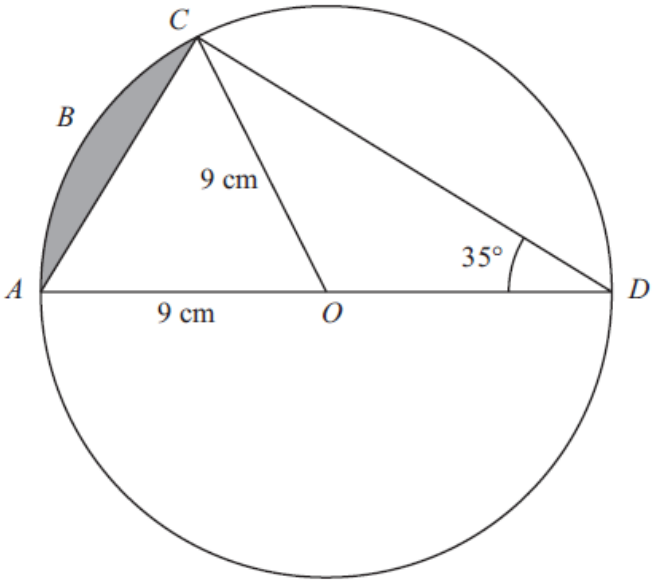


Diagram **NOT** accurately drawn

AOD is a diameter of a circle, with centre *O* and radius 9 cm.
ABC is an arc of the circle.
AC is a chord.
Angle *ADC* = 35°

Calculate the area of the shaded segment.
Give your answer correct to 3 significant figures.

..... cm^2

5.

(a) The equation of a line **L** is $2x - 3y = 6$
Find the gradient of **L**.

.....

(3)

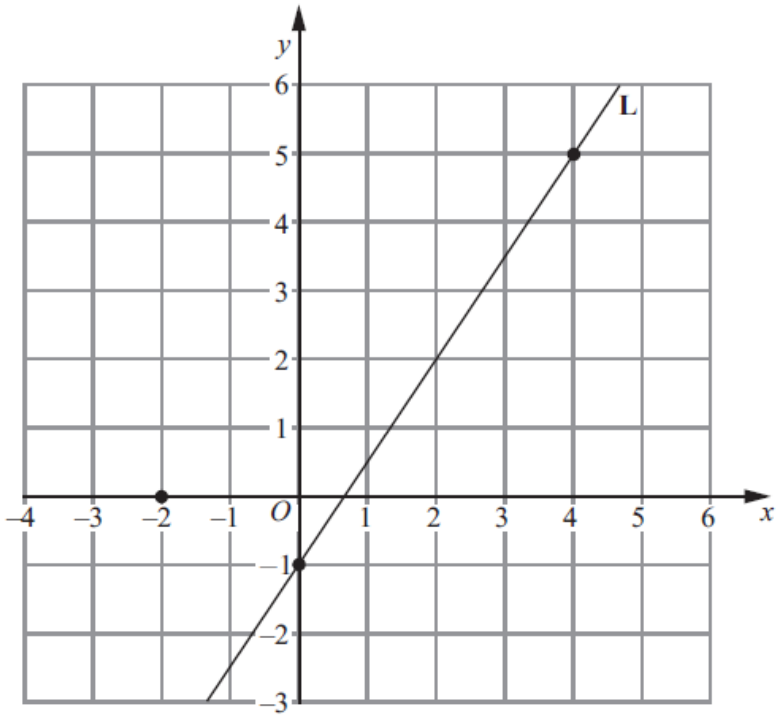
(b) Find the equation of the line which is parallel to **L** and passes through the point (6, 9).

.....

(2)

6.

The points (0, –1) and (4, 5) lie on the straight line **L**.



(a) Work out the gradient of **L**.

.....

(2)

(b) Write down an equation of **L**.

.....

(1)

(c) Find an equation of the line which is parallel to **L** and passes through the point (– 2, 0)

.....

(2)

7.

Show that $(6-\sqrt{8})^2 = 44 - 24\sqrt{2}$

Show each stage of your working clearly.

8.

Show that $\dfrac{\sqrt{3}+\sqrt{27}}{\sqrt{2}}$ can be expressed in the form $\sqrt{k}$ where k is an integer.

State the value of k.

$k =$ .....

9.

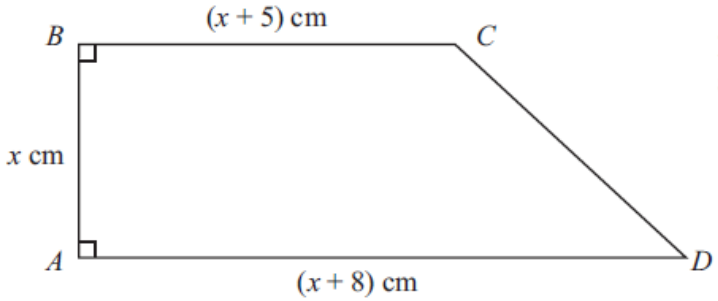


Diagram **NOT** accurately drawn

The diagram shows a trapezium $ABCD$ with AD parallel to BC.
$AB = x$ cm, $BC = (x + 5)$ cm and $AD = (x + 8)$ cm.
The area of the trapezium is 42 cm^2.

(a) Show that $2x^2 + 13x - 84 = 0$

(2)

(b) Calculate the perimeter of the trapezium.

..... cm

10.

The diagram shows a rectangular playground of width x metres and length $3x$ metres.

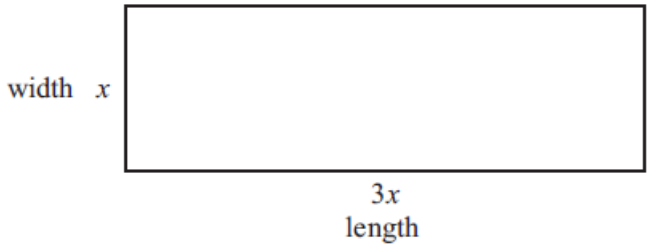


Diagram **NOT** accurately drawn

The playground is extended, by adding 10 metres to its width and 20 metres to its length, to form a larger rectangular playground.

The area of the larger rectangular playground is double the area of the original playground.

(a) Show that $3x^2 - 50x - 200 = 0$

(3)

(b) Calculate the area of the original playground.

..... m^2

(5)