

Mixed Exercise 4

1. Factorise completely,

(a) $3x^2 - 10x + 8$

(b) $2x^2 - x - 10$

(c) $4x^3 + 4x^2 - 3x$

(d) $18a^3 - 50ab^2$

(e) $2a(3a - 2b) - 5b(3a - 2b)$

(f) $3x^2(2x + 5y) + 4y^2(2x + 5y)$

2. Expand and simplify without using a calculator,

(a) $(2 - 5\sqrt{3})(4 + 3\sqrt{3})$

(b) $(4\sqrt{5} + 3\sqrt{3})(2\sqrt{5} - 5\sqrt{3})$

3. Rationalise the denominator:

(a) $\frac{3}{5-2\sqrt{3}}$

(b) $\frac{\sqrt{5}+\sqrt{2}}{3\sqrt{5}-2\sqrt{2}}$

4.

$$(\sqrt{a} + \sqrt{8a})^2 = 54 + b\sqrt{2}$$

a and b are positive integers.

Find the value of a and the value of b .

Show your working clearly.

$a =$

$b =$

5.

$$(3 + \sqrt{a})(4 + \sqrt{a}) = 17 + k\sqrt{a} \text{ where } a \text{ and } k \text{ are positive integers.}$$

Find the value of a and the value of k .

$a =$

$k =$

6.

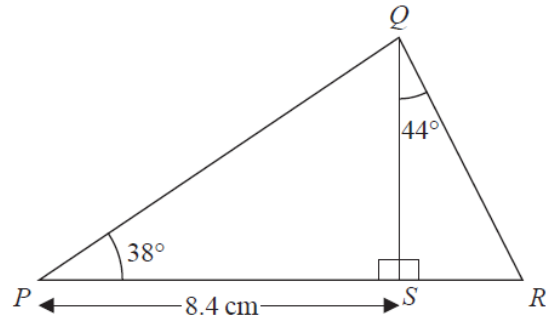


Diagram **NOT**
accurately drawn

PSR is a straight line.

Angle $PSQ = 90^\circ$

$PS = 8.4 \text{ cm}$

Angle $QPS = 38^\circ$

Angle $SQR = 44^\circ$

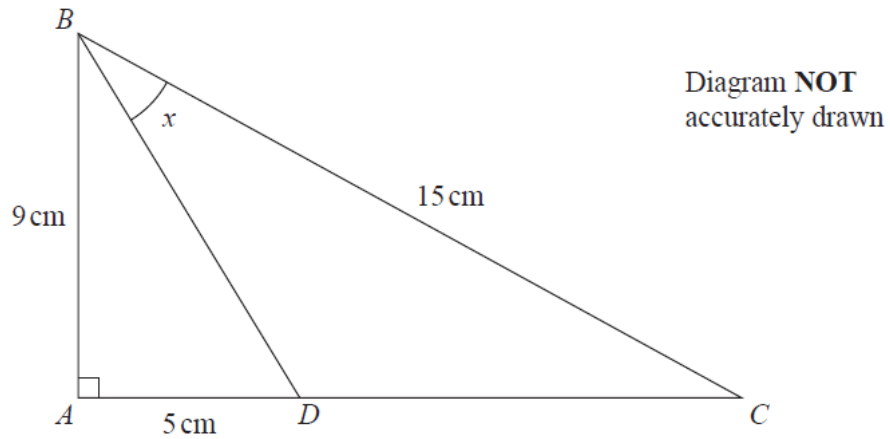
Work out the length of QR .

Give your answer correct to 3 significant figures.

.....cm

7.

The diagram shows triangle ABC .



$AB = 9\text{ cm}$ $BC = 15\text{ cm}$
 D is the point on AC such that $AD = 5\text{ cm}$.
Angle $BAC = 90^\circ$

Calculate the size of angle x .
Give your answer to the nearest degree.

o

8.

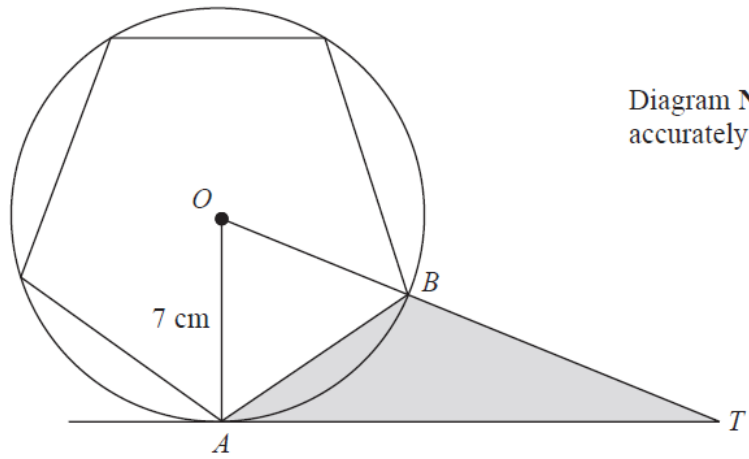


Diagram **NOT**
accurately drawn

The diagram shows a regular pentagon inside a circle, centre O .
The points A and B lie on the circle such that AB is a side of the pentagon.
 $OA = 7$ cm.
 TA is a tangent to the circle and OBT is a straight line.

Calculate the area of triangle ABT .
Give your answer correct to 3 significant figures.

..... cm²