Solve, for $0 \leq x < 360°$, the equation,

$$\tan^2(x) = 3$$

(a) Show that the equation

$$6\cos^2 x = 4 - \sin x$$

Can be written in the form

$$6\sin^2 x - \sin x - 2 = 0$$

(3)

(b) Hence solve, for $0 \leq x < 360°$, the equation,

$$6\cos^2 x = 4 - \sin x$$

(6)

Given that $x > 0$, find in the form $k\sqrt{3}$ the value of x such that

$$x(x - 2) = 2(6 - x).$$

Solve each equation, giving your answers as simply as possible in terms of surds.

$$x\sqrt{18} - 4 = \sqrt{8}$$

$$x\sqrt{5} + 2 = \sqrt{20}\,(x - 1)$$

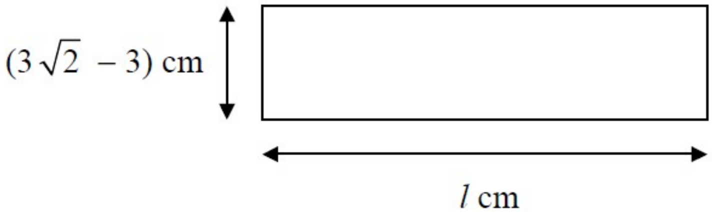
Solve each equation for x in the interval $0 \leq x \leq 360°$.

$3\cos^2 x - \sin^2 x = 2$

$3\sin x \tan x = 8$

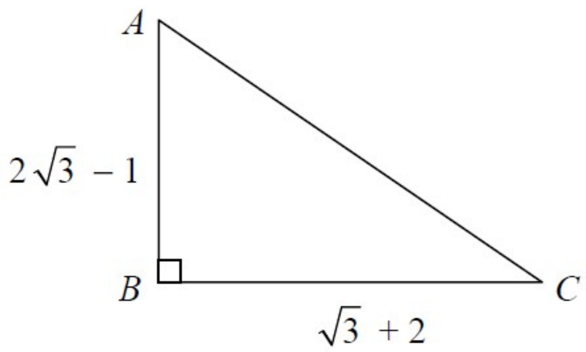
Find all values for x in the interval $0 \leq x < 360°$, for which

$$2\cos^2 x - 3\sin^2 x = 14\cos x$$



The diagram shows a rectangle measuring $(3\sqrt{2} - 3)$ cm by l cm.

Given that the area of the rectangle is 6 cm^2, find the exact value of l in its simplest form.



In triangle ABC, $AB = 2\sqrt{3} - 1$, $BC = \sqrt{3} + 2$ and $\angle ABC = 90°$.

a Find the exact area of triangle ABC in its simplest form.

b Show that $AC = 2\sqrt{5}$.

c Show that $\tan(\angle ACB) = 5\sqrt{3} - 8$.

(a) Show that the equation

$$3\sin 2x \tan 2x = \cos 2x + 2$$

Can be written in the form

$$4\cos^2 2x + 2\cos 2x - 3 = 0$$

(4)

(b) Find all values for x in the interval $0 \leq x < 180°$, for which

$$3\sin 2x \tan 2x = \cos 2x + 2$$

Give your answers to two decimal places.

(6)

Prove that

a $(\sin x + \cos x)^2 \equiv 1 + 2 \sin x \cos x$

b $\dfrac{1}{\cos x} - \cos x \equiv \sin x \tan x, \quad \cos x \neq 0$

Given that the point with coordinates $(1+\sqrt{3}, 5\sqrt{3})$ lies on the curve with the equation

$$y = 2x^2 + px + q,$$

find the values of the rational constants p and q.

a Simplify $(2-\sqrt{3})(2+\sqrt{3})$.

b Express $\dfrac{2}{2-\sqrt{3}}$ in the form $a+b\sqrt{3}$.