

4th February

Higher Plus 5-a-day



Corbettmaths

Write

$$(\sqrt{2} + \sqrt{6})^2$$

in the form

$$a + b\sqrt{3}$$

$$(\sqrt{2} + \sqrt{6})(\sqrt{2} + \sqrt{6})$$

$$2 + \sqrt{2} + \sqrt{2} + 6$$

$$8 + 2\sqrt{2}$$

$$\sqrt{12} = \sqrt{4 \times 3} \\ = 2\sqrt{3}$$

$$8 + 2(2\sqrt{3})$$

$$8 + 4\sqrt{3}$$

Make c the subject of

$$x = \frac{y^2 + c}{y - c}$$

$$x(y - c) = y^2 + c$$

$$xy - cx = y^2 + c$$

$$xy - y^2 = c + cx$$

$$c(1+x) = xy - y^2$$

$$c = \frac{xy - y^2}{1+x}$$

Find the nth term of the sequence

$$12 \ 14 \ 18 \ 24 \ 32 \dots$$

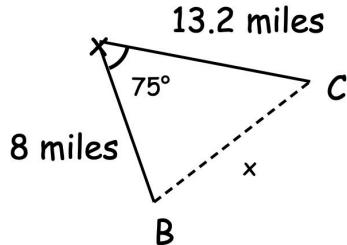
$$\begin{matrix} 2 & 4 & 6 & 8 \\ 2 & 2 & 2 \end{matrix}$$

$$a = 1 \quad b = -1 \quad c = 12$$

$$n^2 - n + 12$$

Helicopter A and Helicopter B both take off from the same location. Helicopter A flies 8 miles on a bearing of 172° . Helicopter B flies 13.2 miles on a bearing of 097° .

How far is helicopter A from B?



$$x^2 = 8^2 + 13.2^2 - (2 \times 8 \times 13.2 \times \cos 75^\circ)$$

$$x^2 = 183.577417674$$

$$x = 13.549\dots$$

13.55 miles

13.55 miles

Find the minimum point of the graph
 $y = x^2 - 9x - 20$

$$y = (x - 4.5)^2 - 20.25 - 20$$

$$y = (x - 4.5)^2 - 40.25$$

$$(4.5, -40.25)$$