11th April **Higher Plus 5-a-day**

Corbettmaths

Charlotte invests £5000.
The bank pays 10% interest for the first year and then y% compound interest every year after that.

After three years, Charlotte has £5610.55

Calculate y

$5000 \times 1.1 = 5500$

$5500 \times y^2 = 5610.55$

$y^2 = 1.0201$

$y = 1.01$ 1%

The distance between the points (–3, –4) and (q, 5) is 15. (triangle 9, 12, 15)

Find the possible values of q.

$(-3-q)^2 + (-4-5)^2 = 15^2$

$(-3-q)(-3-q) + 81 = 225$

$9 + 6q + q^2 + 81 = 225$

$q^2 + 6q - 135 = 0$

$(q-9)(q+15) = 0$

$q = 9$ or $q = -15$

Use completing the square to find the equation of the line of symmetry of the curve $y = x^2 + 8x + 5$

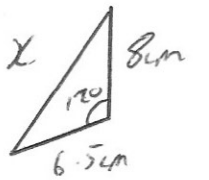
$y = (x+4)^2 - 16 + 5$

$y = (x+4)^2 - 11$

$x = -4$

The minute hand of a clock is 8cm long. The hour hand is 1.5cm shorter.

Calculate the distance between the tips of the hands at 8 o'clock.



$x^2 = 8^2 + 6.5^2 - 2 \times 8 \times 6.5 \times \cos 120$

$x^2 = 158.25$

$x = 12.58\text{cm}$

Find the exact values of w

$$3^{w^2} = 9 \times 27^{w+5}$$

$3^{w^2} = 3^2 \times (3^3)^{w+5}$

$3^{w^2} = 3^2 \times 3^{3w+15}$

$3^{w^2} = 3^{3w+17}$

$w^2 = 3w + 17$

$w^2 - 3w - 17 = 0$

$a = 1$, $b = -3$, $c = -17$ → quadratic formula

$w = \frac{3}{2} + \frac{\sqrt{77}}{2}$ or $w = \frac{3}{2} - \frac{\sqrt{77}}{2}$