Name: _____ 5-a-day Higher Plus

17th October

Corbettmaths

m is inversely proportional to x^2

when m = 3, x = 5

$m \propto \frac{1}{x^2}$

$m = \frac{k}{x^2}$

Find the value of m when m = x

$3 = \frac{k}{25}$

$k = 75$

$m = \frac{75}{x^2}$

$x = \frac{75}{x^2}$

$x^3 = 75$

$x = 4.21716..$

Solve the simultaneous equations

$x + y = 10$

$y = 2x^2 + 4$

$y = 10 - x$

$10 - x = 2x^2 + 4$

$0 = 2x^2 + x - 6$

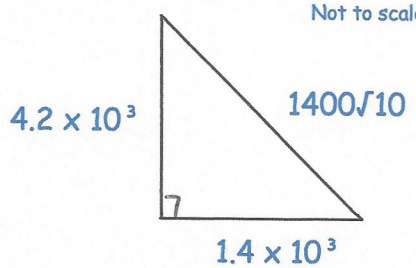
$x = \frac{3}{2}$ or $x = -2$

$y = 8.5$ or $y = 12$

$(\frac{3}{2}, 8\frac{1}{2})$

$(1.5, 8.5)$ or $(-2, 12)$

Not to scale



Is the triangle shown a right angle triangle?

$(1.4 \times 10^3)^2 + (4.2 \times 10^3)^2 =$

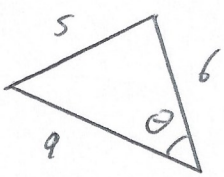
19600000

$(1400\sqrt{10})^2 = 19600000$

Yes

The lengths of the sides of a triangle are in the ratio 5:6:9

Calculate the size of the smallest angle.



$\cos\theta = \frac{9^2 + 6^2 - 5^2}{2 \times 9 \times 6}$

$\cos\theta = \frac{23}{27}$

$\theta = 31.59°$

The point M has coordinates $(1, \sqrt{2})$ and the point N has coordinates $(\sqrt{2}, 3)$.

Find the gradient of MN in the form $a + b\sqrt{2}$

$\frac{3 - \sqrt{2}}{\sqrt{2} - 1} \times \frac{(\sqrt{2}+1)}{(\sqrt{2}+1)}$

$\frac{3\sqrt{2} + 3 - 2 - \sqrt{2}}{2 - 1}$

$2\sqrt{2} + 1$