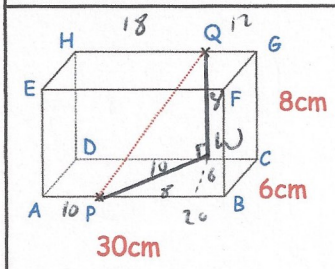
Name: _____ 5-a-day Higher Plus

1st September

Corbettmaths



P is a point on AB, such that AP:PB is 1:2
Q is a point on GH, such that GQ:QH is 2:3

Calculate the distance PQ.

$PW^2 = 6^2 + 8^2$

$PW^2 = 100$ $PW = \sqrt{100} = 10$

$QW = 8$

$PQ^2 = 8^2 + 10^2$

$= 164$

$PQ = \sqrt{164}$

$= 12.806\text{cm}$

The line Q passes through the points (–10, –2) and (–8, –8)

x_1 y_1 x_2 y_2

The line R passes through the points (1, 2) and (10, a)

The lines Q and R are perpendicular.

Find a.

gradient of Q $= \frac{-8-(-2)}{-8-(-10)} = \frac{-6}{2} = -3$

∴ gradient of R is $\frac{1}{3}$

$\frac{a-2}{10-1} = \frac{1}{3}$ $\frac{a-2}{9} = \frac{1}{3}$

$a = 5$

A square based pyramid, with a perpendicular height of 15cm is placed on a table.

[redacted]

The weight of the pyramid is 70.56N.
The pyramid exerts a pressure of 4900N/m² on the table.

P F A

Work out the volume of the square based pyramid.

$A = \frac{F}{P} = \frac{70.56}{4900} = 0.0144\text{m}^2$

$0.0144 \times 10000 = 144\text{cm}^2$

$V = \frac{1}{3}Ah$

$= \frac{1}{3} \times 144 \times 15 = 720\text{cm}^3$

Solve the equations

$x^2 + y^2 = 20$
$x + y = 6$

$x = 6 - y$

$(6-y)^2 + y^2 = 20$

$36 - 12y + y^2 + y^2 = 20$

$2y^2 - 12y + 16 = 0$

$y^2 - 6y + 8 = 0$

$(y-4)(y-2) = 0$

$y = 2$ $y = 4$

$x = 4$ $x = 2$

$(2, 4)$ or $(4, 2)$