M8 = 11 days to go!

when centre (0,0)

$x^2 + y^2 = r^2$

12 A circle has centre (0,0) and radius 5

(a) Show that the point P (3, –4) lies on the circle.

$x^2 + y^2 = 5^2$

$x^2 + y^2 = 25$

$3^2 + (-4)^2$

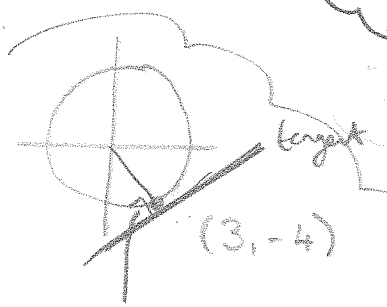
$9 + 16 = 25$ so P lies on circle [2]

sub (3, -4) into equation of a circle

(b) Find the coordinates of the point where the tangent to the circle at point P meets the x axis.

$y = 0$

gradient = $\frac{-1}{\text{gradient of radius}}$



gradient of radius

$\frac{\text{rise}}{\text{run}} = \frac{-4}{3}$

gradient of tangent $= \frac{-1}{(-4/3)}$

$= \frac{3}{4}$

equation of tangent at (3,-4): $y = \frac{3}{4}x + c$

$-4 = \frac{9}{4} + c$

$c = -6.25$

$y = \frac{3}{4}x - \frac{25}{4}$

$y = 0$

$0 = \frac{3}{4}x - \frac{25}{4}$

Answer $\left(\frac{25}{3}, 0\right)$ [6]

$\frac{25}{4} = \frac{3}{4}x$

so $x = \frac{25}{3}$

Write $2.1\dot{6}\dot{5}$ as a mixed number.
Give your answer in its simplest form.

$x = 0.1\dot{6}\dot{5}$

$10x = 1.\dot{6}\dot{5}$

$1000x = 165.\dot{6}\dot{5}$

$1000x - 10x = 165.\dot{6}\dot{5} - 1.\dot{6}\dot{5}$

$990x = 164$

$x = \frac{164}{990}$

$0.1\dot{6}\dot{5} = \frac{82}{495}$

so $2.1\dot{6}\dot{5}$

Digits after d.point need to be the same

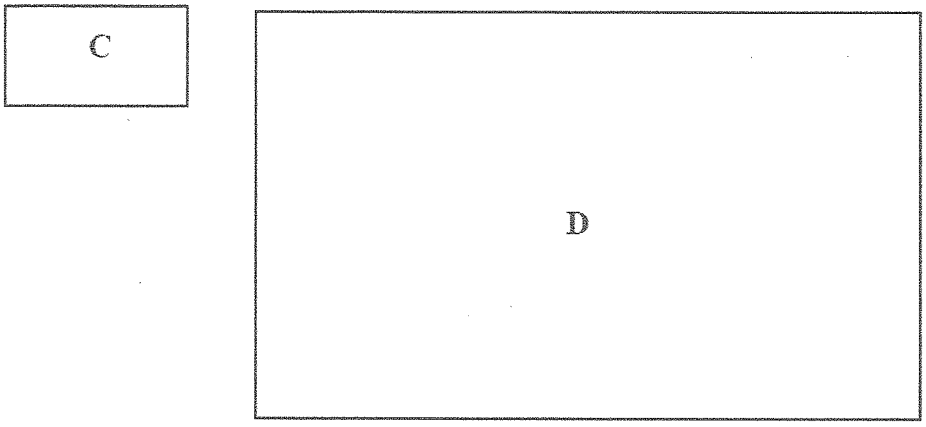
$2\frac{82}{495}$

(3)

In the diagram rectangle **C** has been enlarged by a scale factor of 4 to give rectangle **D**.

How many times bigger is the area of rectangle **D** than the area of rectangle **C**?

Length S.F = L
Area S.F = L^2
Volume S.F = L^3



Length S.F = 4
Area S.F = 4^2
Volume S.F = 4^3

SO $4 \times 4 = 16$

Answer 16 times bigger [2]

2. Solve the equations

equal to 0

$xy = 24$
$x = y - 2$

* sub linear into quadratic *

$x \times y = 24$
$(y-2) \times y = 24$
$y(y-2) = 24$
$y^2 - 2y - 24 = 0$

Factorise

$P = -24$ $\quad -6 \times 4 = -24$ ✓
$S = -2$ $\quad -6 + 4 = -2$ ✓
$(y-6)(y+4) = 0$
$y - 6 = 0$ $\quad y + 4 = 0$
$y = 6$ $\quad y = -4$