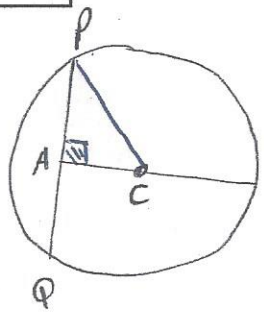
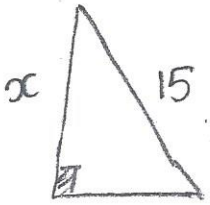
Topic: Pythagoras

21:01





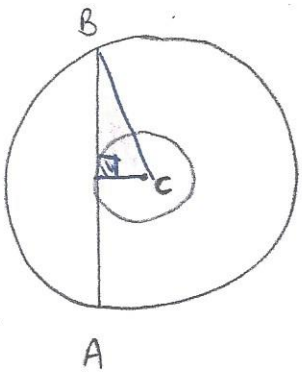
27cm - radius
= 12cm

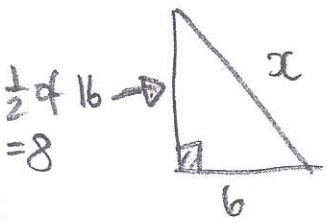
$x^2 = 15^2 - 12^2$
$= 81$
$x = \sqrt{81}$
$= 9\text{cm}$

$AP = \frac{1}{2}$ of PQ

$PQ = 9 \times 2$
$= 18\text{cm}$

21.02

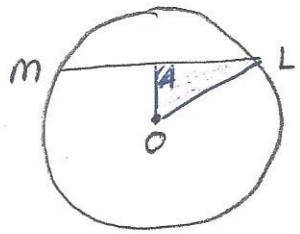




$x^2 = 8^2 + 6^2$
$= 100$
$x = \sqrt{100}$
$= 10\text{cm}$

Topic: Pythagoras

21.03



$x^2 = 1.2^2 - 0.9^2$

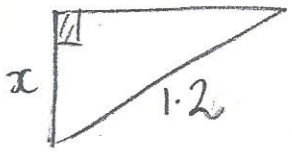
$= 0.63$

$x = 0.8$

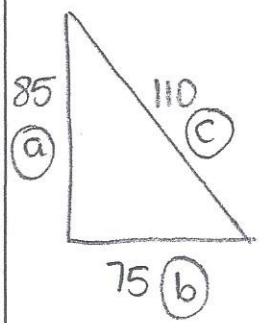
Depth = 0.8 + Radius

= 2 m

1/2 of 1.8 = 0.9



21.04



$c^2 = 110^2 = 12100$

$a^2 + b^2 = 85^2 + 75^2 = 12850$

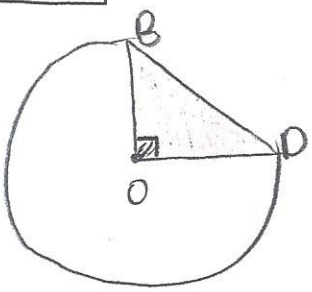
$c^2 \neq a^2 + b^2$

By the Converse of Pythagoras the triangle is <u>not</u> right angled.

⇒ Hightown is <u>not</u> directly north of Lowtown.

Topic: Pythagoras

21.05



$x^2 = 60^2 + 60^2$

$= 7200$

$x = \sqrt{7200}$

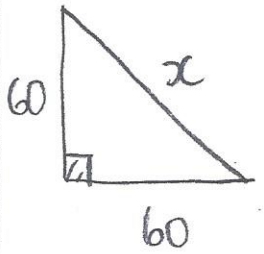
$= 84.9$

diameter $= 2 \times 60$

$\downarrow$

Arc length $= \frac{270}{360} \times \pi \times 120$

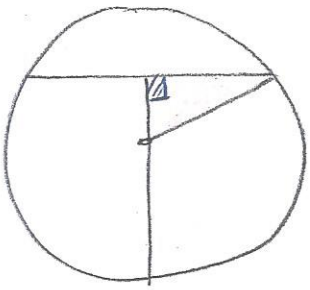
$= 282.7$



Total Perimeter $= 282.7 + 84.9$

$= 367.6$ cm

21.06



$w^2 = 2.1^2 - 1.3^2$

$= 2.72$

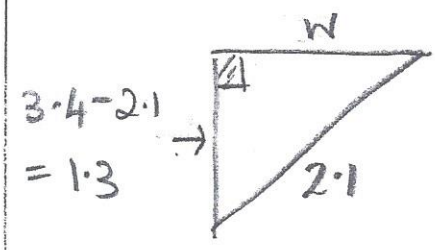
$w = \sqrt{2.72}$

$= 1.65$

w is half of x

$\Rightarrow x = 2 \times 1.65$m

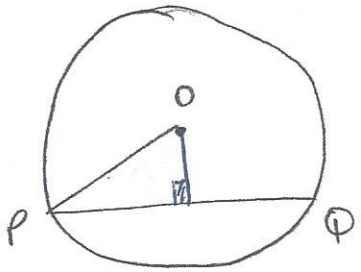
$= 3.3$m



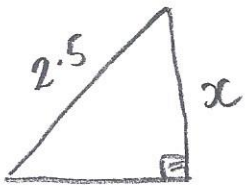
b) 0.8m would give the same surface width

Topic: Pythagoras

21.07



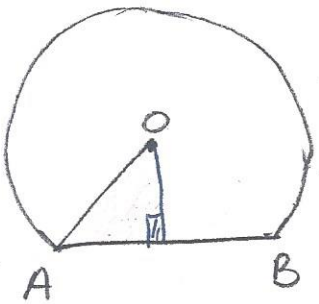
$x^2 = 2.5^2 - 1.5^2$
$= 4$
$x = \sqrt{4}$
$= 2$



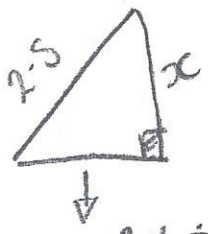
$3m \div 2 = 1.5m$

d = diameter − (radius + x)
$= 5 - (2.5 + 2)$
$= 5 - 4.5$
$= 0.5m$

21.08



$x^2 = 2.5^2 - 1.2^2$
$= 4.81$
$x = \sqrt{4.81}$
$= 2.19$

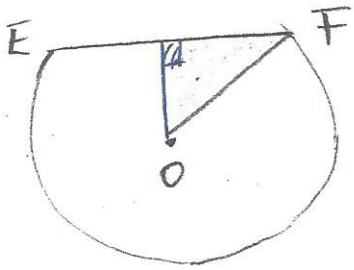


$2.4 \div 2 = 1.2$

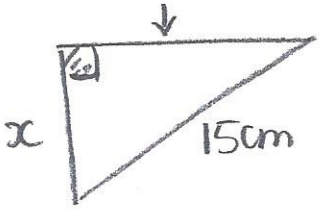
Height of the tunnel is ⇒
Radius + x
$= 2.5 + 2.19$
$= 4.69m$

Topic: Pythagoras

21.09



$18 \div 2 = 9\text{cm}$



$x^2 = 15^2 - 9^2$

$= 144$

$x = \sqrt{144}$

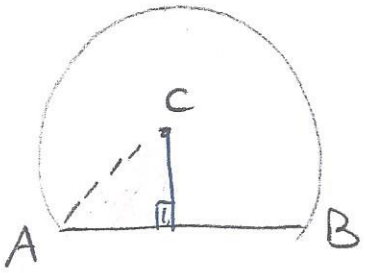
$= 12\text{cm}$

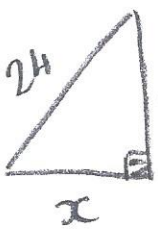
Width = Radius + x

$= 15 + 12$

$= 27\text{cm}$

21.10





$35 - 24 = 11$

$x^2 = 24^2 - 11^2$

$= 455$

$x = \sqrt{455}$

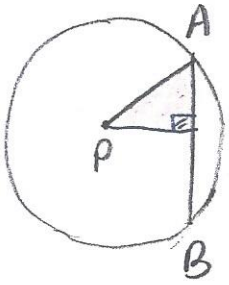
$= 21.3\text{cm}$

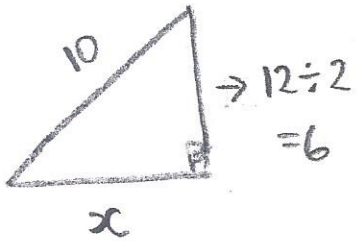
$AB = 21.3\text{cm} \times 2$

$= 42.6\text{cm}$

Topic: Pythagoras

21.11

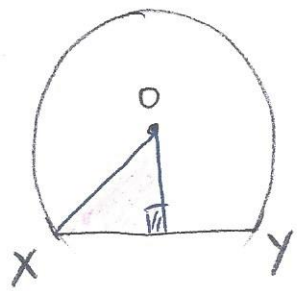


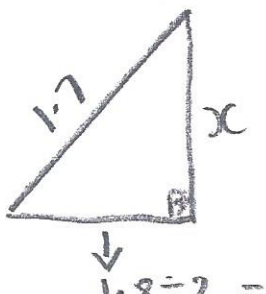


$$x^2 = 10^2 - 6^2$$
$$= 64$$
$$x = \sqrt{64}$$
$$= 8 \text{ cm}$$

$$PQ = 8\text{cm} \times 2$$
$$= 16\text{cm}$$

21.12



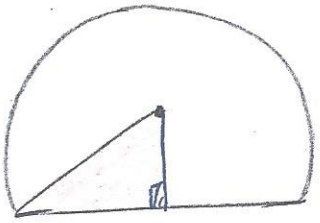


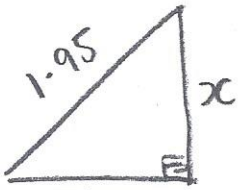
$$x^2 = 1.7^2 - 0.9^2$$
$$= 2.08$$
$$x = \sqrt{2.08}$$
$$= 1.44 \text{ m}$$

$$\text{Height} = \text{Radius} + x$$
$$= 1.7 + 1.44$$
$$= 3.14 \text{ m}$$

Topic: Pythagoras

21.13





$2.5 \div 2 = 1.25$

$x^2 = 1.95^2 - 1.25^2$

$= 2.24$

$x = \sqrt{2.24}$

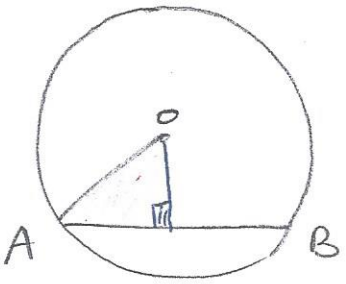
$= 1.5\text{m}$

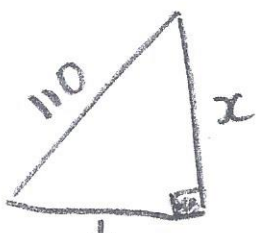
Height = Radius + x

$= 1.95 + 1.5$

$= 3.45\text{m}$

21.14





$140 \div 2 = 70$

$x^2 = 110^2 - 70^2$

$= 7200$

$x = \sqrt{7200}$

$= 84.9$

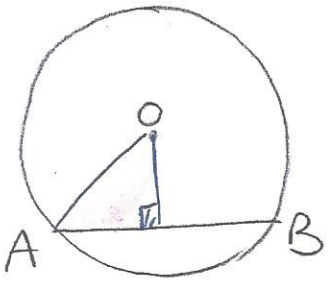
d = diameter − (radius + x)

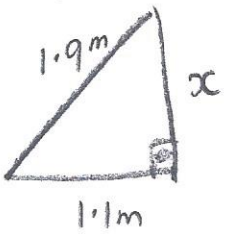
$= 220 - (110 + 84.9)$

$= 25.1\text{ mm}$

Topic: Pythagoras

21.15





$x^2 = 1.9^2 - 1.1^2$

$= 2.4$

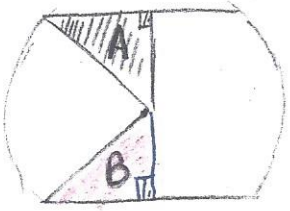
$x = \sqrt{2.4} = 1.5$

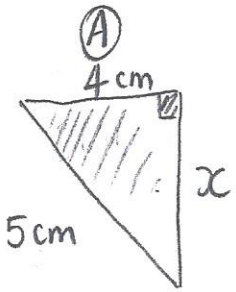
depth = Radius − 1.5

= 1.9 − 1.5

= 0.4 m

21.16

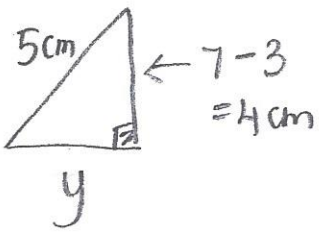




$x^2 = 5^2 - 4^2$

$= 9$

$x = \sqrt{9} = 3$



$y^2 = 5^2 - 4^2$

$= 9$

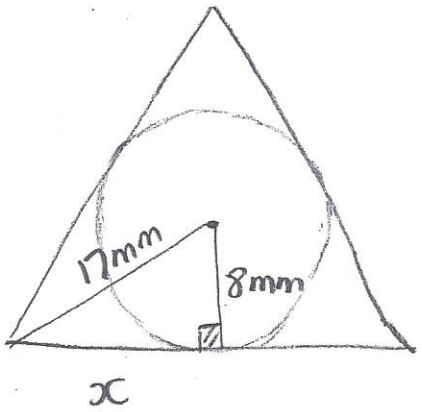
$y = \sqrt{9} = 3\text{cm}$

width of base = 2 × 3cm

= 6cm

Topic: Pythagoras

21.17



$x^2 = 17^2 - 8^2$

$= 225$

$x = \sqrt{225} = 15\text{mm}$

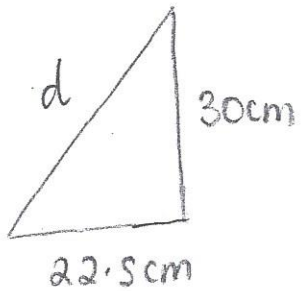
One side of the triangle $= 2 \times 15\text{mm}$

$= 30\text{mm}$

Perimeter $= 3 \times 30\text{mm}$

$= 90\text{mm}$

21.18



$30^2 + 22.5^2 = 1406.25$

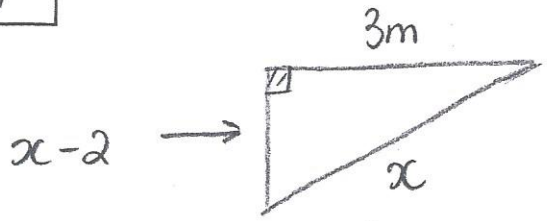
$37.3^2 = 1391.29$

$a^2 + b^2 \neq c^2$ so by the converse of pythagoras the triangle is not right angled.

The frame is not retangular

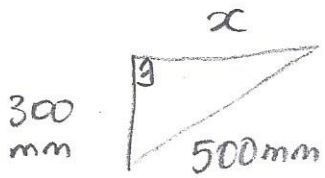
Topic: Pythagoras

21.19



$$x^2 = (x-2)^2 + 3^2$$
$$x^2 = x^2 - 4x + 4 + 9$$
$$x^2 = x^2 - 4x + 13$$
$$x^2 - x^2 + 4x = 13$$
$$4x = 13$$
$$x = 13/4$$
$$x = 3{\cdot}25\text{m}$$

21.20



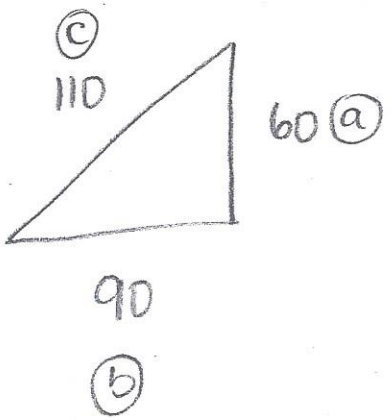
$$2000 - 1800 = 200\text{ mm} \qquad 500 - 200 = 300\text{mm}$$

$$x^2 = 500^2 - 300^2$$
$$= 160000$$
$$x = \sqrt{160000} = 400\text{ mm}$$

$$\text{Width} = 2 \times 400\text{mm}$$
$$= 800\text{mm}$$

Topic: Pythagoras

21.21



$a^2 + b^2 = 60^2 + 90^2$

$= 11700$

$c^2 = 110^2$

$= 12100$

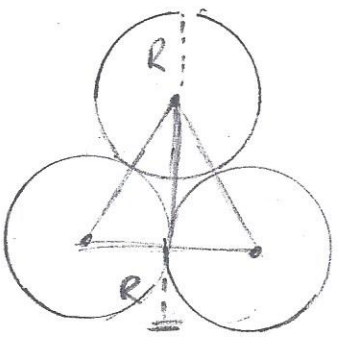
$a^2 + b^2 \neq c$ so by the converse of pythagoras the slab is not right angled.

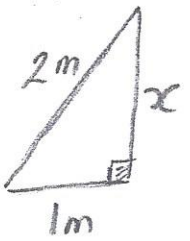
21.22

$x^2 = 2^2 - 1^2$

$= 3$

$x = \sqrt{3} = 1.7m$





$h = 1.7 + 2R$

$= 1.7 + 2$

$= 2.7m$