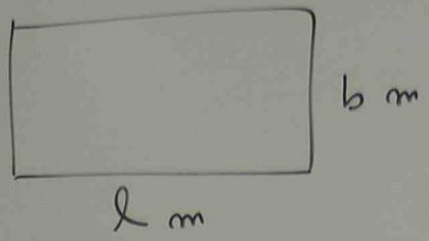
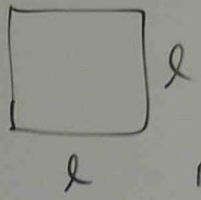
MENSURATION

RECTANGLE

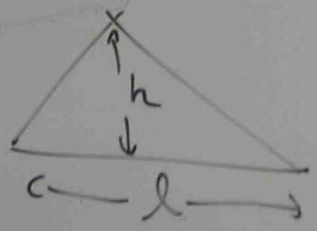


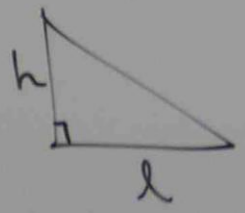
AREA OF RECTANGLE = $l \times b$ m^2

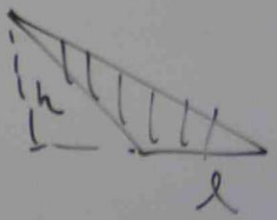


AREA OF SQUARE = l^2

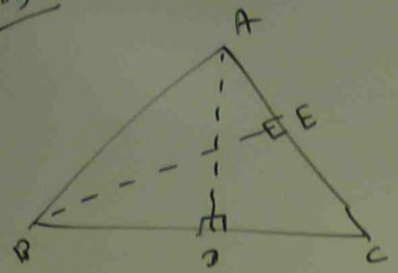
AREA OF TRIANGLE = $\frac{1}{2} l h$







pb



GIVEN THAT

$BC = 6m$, $AD = 4m$, $BE = 5m$

FIND THE LENGTH OF AC.

AREA of $\triangle ABC = \frac{1}{2} \times BC \times AD$

$= \frac{1}{2} \times 6 \times 4$

$= 12\ m^2$

AREA of $\triangle ABC = \frac{1}{2} \times AC \times BE$

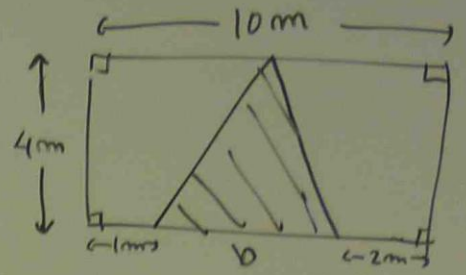
$= \frac{1}{2} \times AC \times 5$

$= 2.5AC$

$\therefore 2.5AC = 12$

$AC = \frac{12}{2.5} = 4.8m$

pb



FIND THE AREA OF TRIANGLE IN SHADING.

$b = 10 - (1+2)$

$= 7\ m$

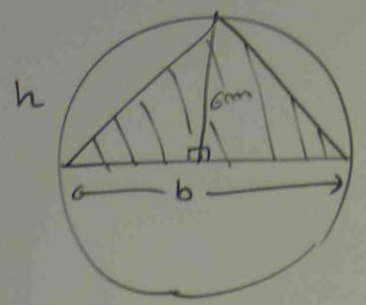
$h = 4\ m$

AREA OF TRIANGLE $= \frac{1}{2} b h$

$= \frac{1}{2} \times 7 \times 4$

$= 14\ m^2$

pb

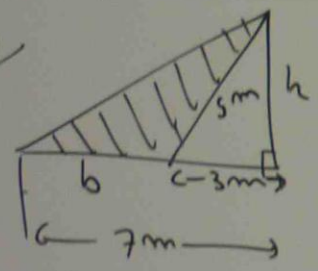


FIND AREA OF TRIANGLE.

$b = 2h = 2 \times 6 = 12m$

AREA OF TRIANGLE $= \frac{1}{2} b h = \frac{1}{2} \times 12 \times 6 = 36 \ m^2$

pb



FIND THE AREA OF TRIANGLE IN SHADING.

$b = 7 - 3 = 4m$

$5^2 = 3^2 + h^2$

$25 = 9 + h^2$

$h^2 = 25 - 9 = 16$

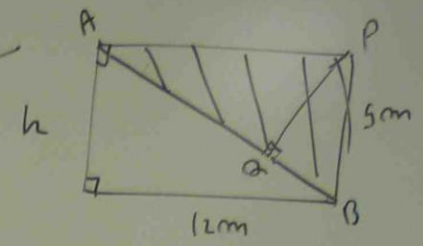
$h = \sqrt{16} = 4m$

AREA $= \frac{1}{2} b h$

$= \frac{1}{2} \times 4 \times 4$

$= 8 m^2$

pb



FIND THE AREA OF SHADED TRIANGLE AND LENGTH PQ.

HEIGHT = 5m

BASE = 12m

AREA $= \frac{1}{2} b h$

$= \frac{1}{2} \times 12 \times 5$

$= 30 \ m^2$

AREA of SHADED $\triangle$ = AREA of NON SHADED $\triangle$

AREA of SHADED $\triangle = 30 m^2$

$\frac{1}{2} \times AB \times PQ = 30$

$AB^2 = 12^2 + h^2$

$AB^2 = 12^2 + 5^2 = 169 \rightarrow AB = \sqrt{169} = 13$

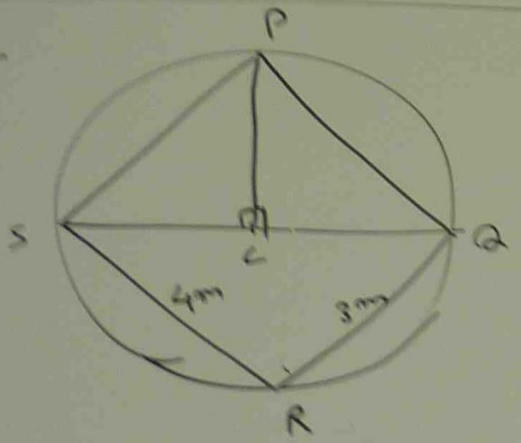
$\frac{1}{2} \times 13 \times PQ = 30$

$PQ = \frac{30 \times 2}{13}$

$= 4.615$

---

pb



C IS THE CENTRE OF CIRCLE.

FIND THE AREA OF QUADRILATERAL PQRS

$\hat{R}$ IS SUBJECT TO SQ (DIAMETER)

$\hat{R} = 90^\circ$

$\triangle SQR$ AREA $= \frac{1}{2} \times RQ \times SR$

$= \frac{1}{2} \times 3 \times 4$

$= 6\ m^2$

$\triangle SQR$ IS RIGHT ANGLE $\triangle$

$SR^2 + RQ^2 = SQ^2$

$4^2 + 3^2 = SQ^2$

$SQ = \sqrt{4^2+3^2} = \sqrt{25} = 5$

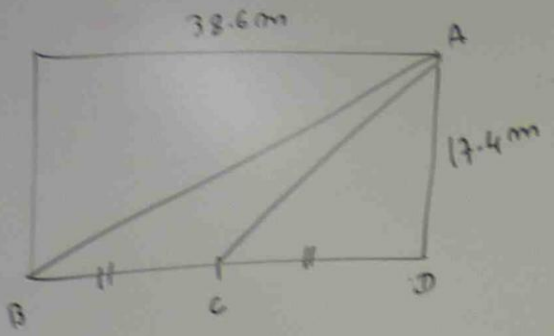
SQ = DIAMETER $= 2\ SC = 2\ CQ = 2\ PC$

$\therefore SC = CQ = PC = \frac{SQ}{2} = \frac{5}{2} = 2.5$

$\triangle PSQ$ AREA $= \frac{1}{2} \times SQ \times PC$

$= \frac{1}{2} \times 5 \times 2.5 = 6.25\ m^2$

Q5



FIND (a) THE AREA OF $\triangle ABC$

(b) THE AREA OF $\triangle ACD$

$BD = 38.6m$

$BC = CD = \frac{BD}{2} = \frac{38.6}{2} = 19.3m$

$\triangle ABC = \frac{1}{2} \times BC \times AD$

$= \frac{1}{2} \times 19.3 \times 17.4$

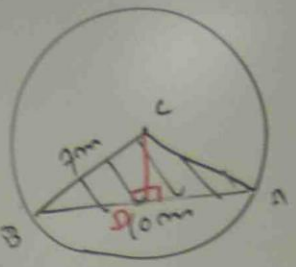
$= 167.91 m^2$

$\triangle ACD = \frac{1}{2} \times CD \times AD$

$= \frac{1}{2} \times 19.3 \times 17.4$

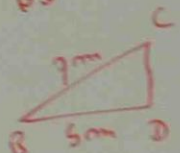
$= 167.91 m^2$

Q6



FIND THE AREA $\triangle ABC$

$BD = AD = 5m$



$BC^2 = BD^2 + CD^2$

$7^2 = 5^2 + CD^2$

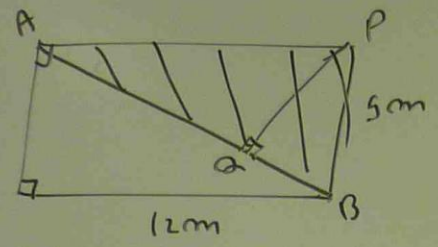
$CD = \sqrt{7^2 - 5^2} = \sqrt{49 - 25} = \sqrt{24} = 4.89$

$\triangle ABC = \frac{1}{2} \times BA \times CD$

$= \frac{1}{2} \times 10 \times 4.89$

$= 24.49 m^2$

pb



FIND THE AREA OF SHADED TRIANGLE AND LENGTH PQ.

HEIGHT = 5 cm

BASE = 12 cm

AREA = $\frac{1}{2}$ b h

= $\frac{1}{2}$ x 12 x 5

= 30 m^2

AREA of SHADED $\triangle$ = AREA of NON SHADED $\triangle$

AREA of SHADED $\triangle$ = 30 m^2

$\frac{1}{2} \times AB \times PQ = 30$

$AB^2 = 12^2 + h^2$

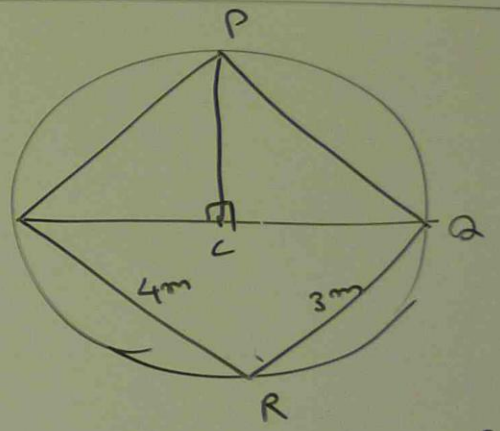
$AB^2 = 12^2 + 5^2 = 169 \rightarrow AB = \sqrt{169} = 13$

$\frac{1}{2} \times 13 \times PQ = 30$

$PQ = \frac{30 \times 2}{13}$

$= 4.615$

pb



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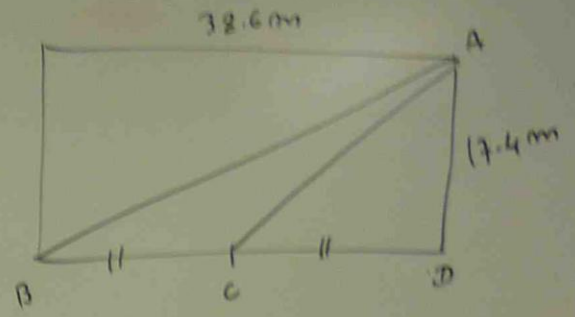
$= \frac{1}{2} \times 5 \times 2.5 = 6.25 m^2$

Pb



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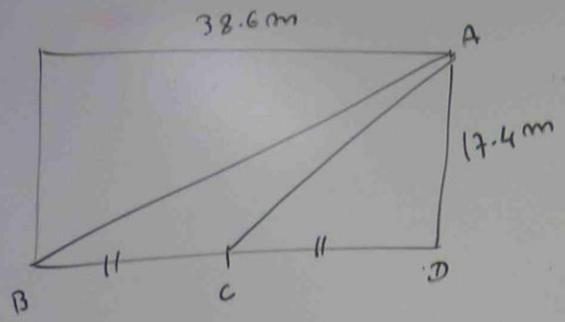
$= 167.91\ m^2$

Pb



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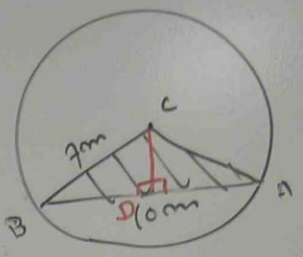
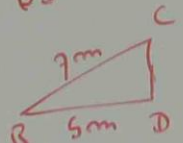
Pb



FIND THE AREA $\triangle ABC$

$BD = AD = 5m$



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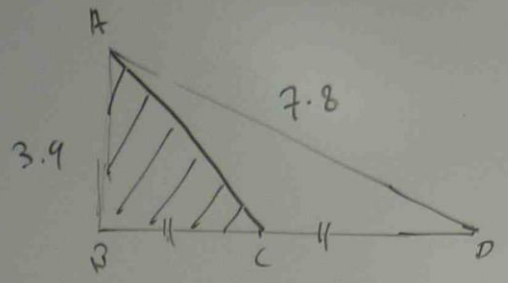
pb



FIND AREA of △ ABC

$AD^2 = AB^2 + BD^2$

$7.8^2 = 3.9^2 + BD^2$

$BD^2 = 7.8^2 - 3.9^2 = 45.63$

$BD = \sqrt{45.63} = 6.75$

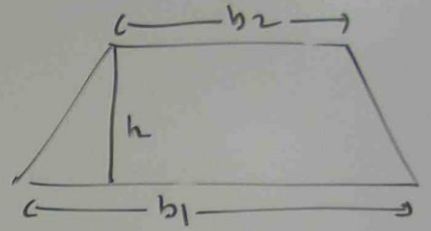
$BC = CD = \frac{BD}{2} = \frac{6.75}{2} = 3.377$

$\triangle ABC = \frac{1}{2} \times BC \times AB$

$= \frac{1}{2} \times 3.377 \times 3.9$

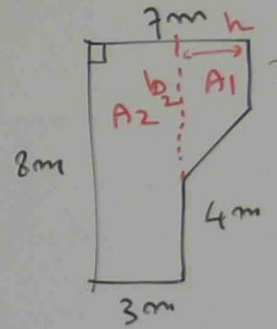
$= 6.58 \ m^2$

TRIPEZOIDAL AREA



$A = \frac{1}{2} h (b_1 + b_2)$

pb



$b_2 = 8 - 4 = 4m$

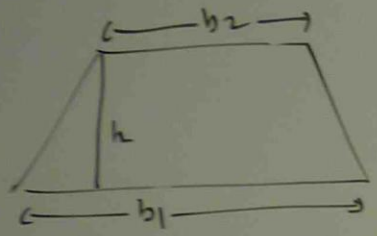
$b_1 = 2m$

$h = 7 - 3 = 4m$

$A_1 = \frac{1}{2} h(b_1 + b_2) = \frac{1}{2} \times 4 \times (4+2)$

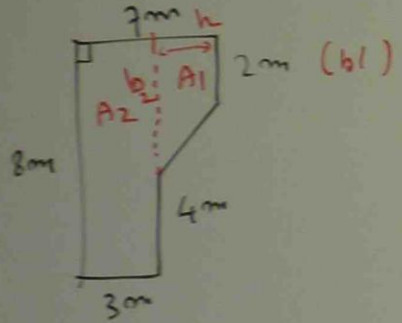
$= 2 \times 6 = 12 m^2$

TRIPARTOIDAL AREA



$$A = \frac{1}{2} h (b_1 + b_2)$$

ab



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$h = 7 - 3 = 4m$

$A_1 = \frac{1}{2} h(b_1 + b_2) = \frac{1}{2} \times 4 \times (4+2)$

$= 2 \times 6 = 12m^2$

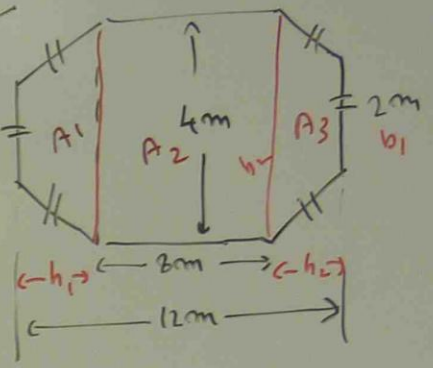
$A_2 = 8 \times 3 = 24m^2$

$A_T = A_1 + A_2$

$= 12 + 24$

$= 36m^2$

ab



$h_1 = h_2 = \frac{12-8}{2} = \frac{4}{2} = 2m$

$A_3 = A_1 = \frac{1}{2} \times h_2 \times (b_1 + b_2)$

$= \frac{1}{2} \times 2 \times (2+4)$

$= 6$

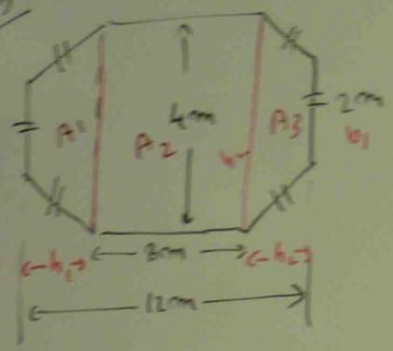
$A_2 = 8 \times 4 = 32$

$A_T = A_1 + A_2 + A_3$

$= 6 + 32 + 6$

$= 44m^2$

pb



$h_1 = h_2 = \frac{12-8}{2} = \frac{4}{2} = 2m$

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$= \frac{1}{2} \times 2 \times (2+4)$

$= 6$

$A_2 = 8 \times 4 = 32$

$A_T = A_1 + A_2 + A_3$

$= 6 + 32 + 6$

$= 44 m^2$

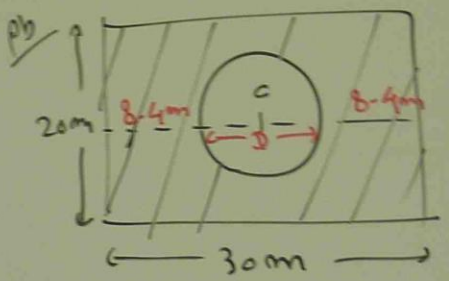
pb

FIND AREA EFGH

$EFGH = \frac{1}{2} \times 1.52 \times (2.74 + 1.86) = 3.496 m^2$

AREA OF CIRCLE $= \frac{\pi}{4} D^2$

pb



$D = 30 - 2 \times 8.4 = 13.2 m$

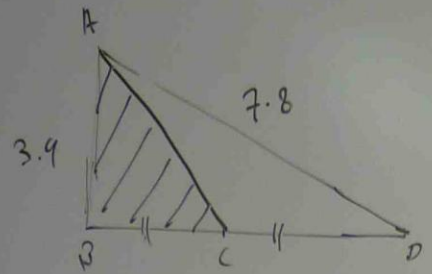
$AREA = \frac{\pi}{4} D^2 = 0.7854 \times (13.2)^2$

$= 136.8 m^2$

ALL ▱ AREA $= 30 \times 20 = 600 m^2$

SHADED AREA $= 600 - 136.8 = 463.2 m^2$

pb



FIND AREA of △ ABC

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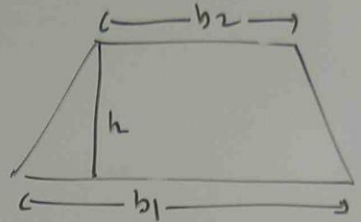
$= \frac{1}{2} \times 3.377 \times 3.9$

$= 6.58 \ m^2$

TRIPLOIDAL AREA



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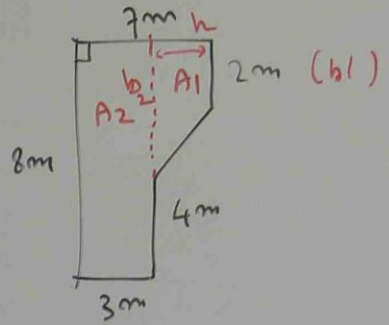
pb



$b_2 = 8 - 4 = 4m$

$b_1 = 2m$

$h = 7 - 3 = 4m$

$A_1 = \frac{1}{2} h(b_1 + b_2) = \frac{1}{2} \times 4 \times (4+2)$

$= 2 \times 6 = 12 m^2$

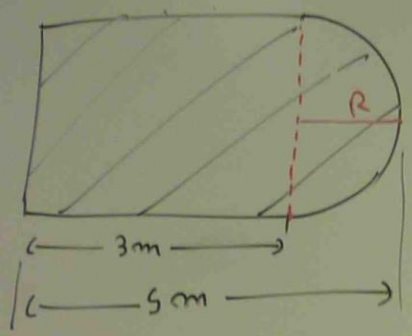
$A_2 = 8 \times 3 = 24 m^2$

$A_T = A_1 + A_2$

$= 12 + 24$

$= 36 m^2$

ph



$R = 5 - 3 = 2\,m$

$D = 2 \times 2 = 4\,m$

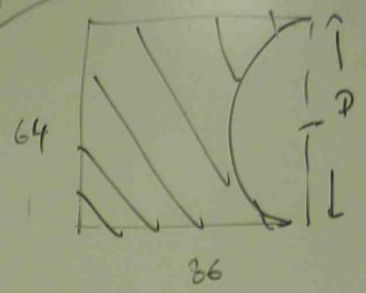
TOTAL AREA = $\square + D$

$= 3 \times 4 + \frac{1}{2} \times \frac{\pi}{4} \times 4^2$

$= 12 + \frac{1}{2} \times 0.7854 \times 16$

$= 18.28\,m^2$

ph



$D = 64$

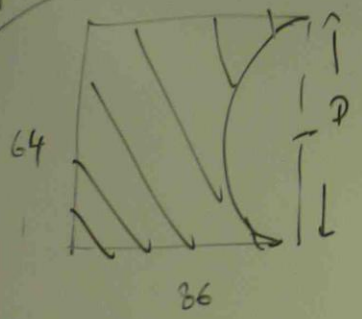
SHADED AREA = $\square - \frown$

$= 86 \times 64 - \frac{1}{2} \times \frac{\pi}{4} D^2$

$= 86 \times 64 - \frac{1}{2} \times 0.7854 \times 64^2$

$= 3895.5\,m^2$

ph



$D = 64$

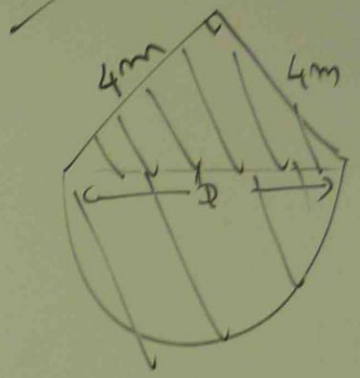
SHADED AREA = $\square - \frac{1}{2}\text{circle}$

$= 86 \times 64 - \frac{1}{2} \times \frac{\pi}{4} D^2$

$= 86 \times 64 - \frac{1}{2} \times 0.7854 \times 64^2$

$= 3895.5\ m^2$

ph



$D^2 = 4^2 + 4^2$

$D = \sqrt{16+16} = 5.65$

TOTAL = $\cup + \triangle$

$= \frac{1}{2} \times \frac{\pi}{4} D^2 + \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 0.7854 \times 5.65^2 + \frac{1}{2} \times 4 \times 4$

$= 20.5\ m^2$