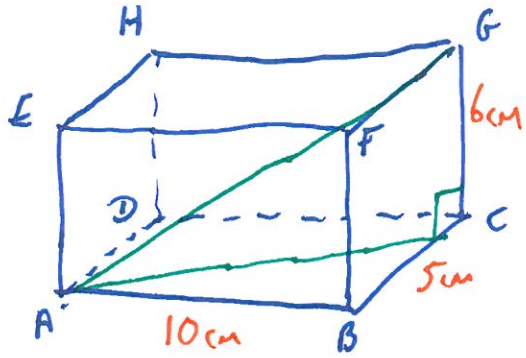
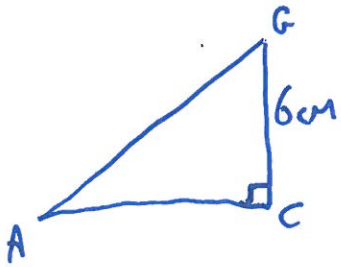
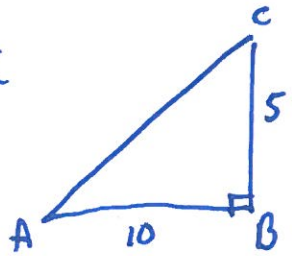
(1)



Need ΔACG to find AG



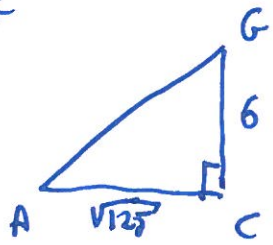
From ΔABC



Using Pythag $AC^2 = 10^2 + 5^2$

$AC = \sqrt{125}$

Now ΔACG



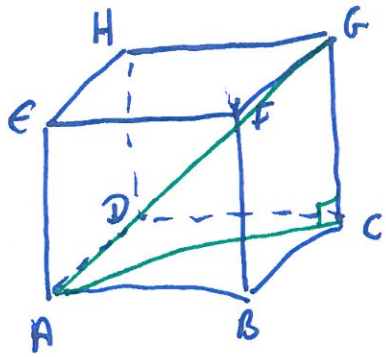
Pythag $AG^2 = (\sqrt{125})^2 + 6^2$

$= 125 + 36$

$AG = \sqrt{161}$

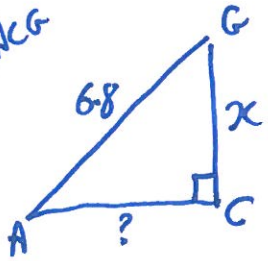
$= 12.7\text{ cm}$

(2)

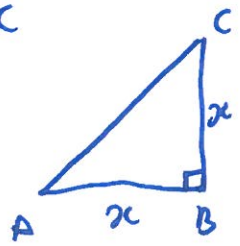


let length of side = x cm

$\triangle ACG$



$\triangle ABC$

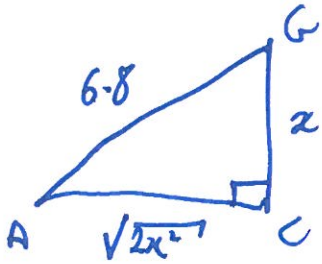


Using pythag $AC^2 = x^2 + x^2$

$AC^2 = 2x^2$

$AC = \sqrt{2x^2}$

IN $\triangle ACG$



using pythag ~~$x^2 + (\sqrt{2x^2})^2 = 6.8^2$~~

$x^2 + (\sqrt{2x^2})^2 = 6.8^2$

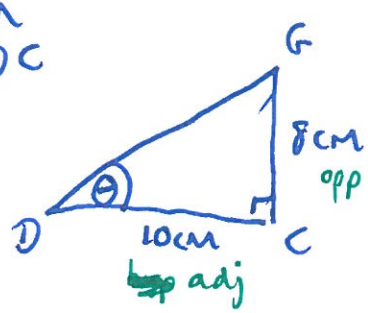
$x^2 + 2x^2 = 46.24$

$3x^2 = 46.24$

$x^2 = \frac{1156}{75}$

$x = \sqrt{\frac{1156}{75}} = 3.9\text{cm}$

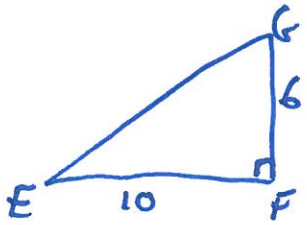
(3) (a) $G\hat{D}C$



$\text{Tan}\,\theta = \frac{8}{10}$

$\theta = \tan^{-1}\left(\frac{8}{10}\right) = 38.7°$

(b)

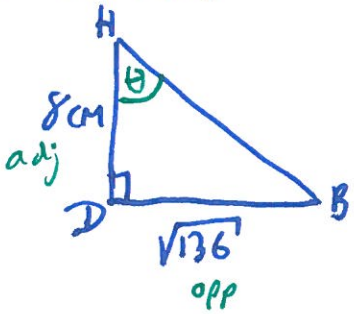


$EG^2 = 10^2 + 6^2$

$= 136$

$EG = \sqrt{136} = 11.7\text{cm}$

(c) $\triangle HBD$



Now DB is a diagonal = diagonal EG

$HB^2 = 8^2 + (\sqrt{136})^2$

$= 64 + 136$

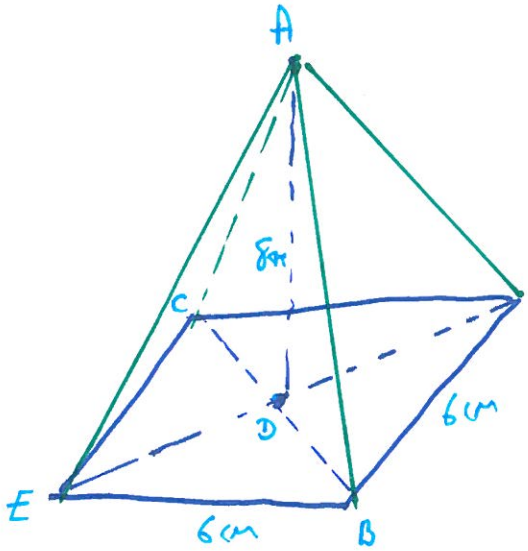
$= 200$

$HB = \sqrt{200} = 14.1$

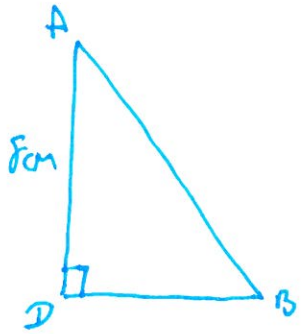
(d) $\text{Tan}\,\theta = \frac{\sqrt{136}}{8}$

$\theta = \text{Tan}^{-1}\left(\frac{\sqrt{136}}{8}\right) = 55.6°$

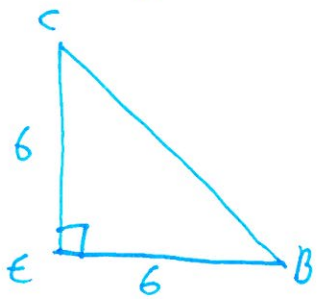
(4)



Using $\triangle ABD$



1st $\triangle CEB$



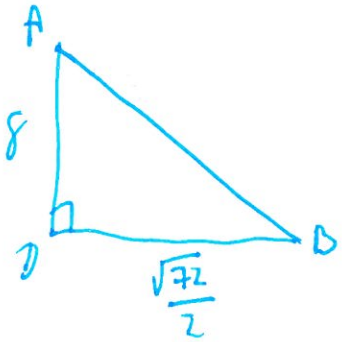
$BC^2 = 6^2 + 6^2$

$= 72$

$BC = \sqrt{72}$

Now $BD = \frac{1}{2} BC = \frac{\sqrt{72}}{2}$

So in $\triangle ABD$



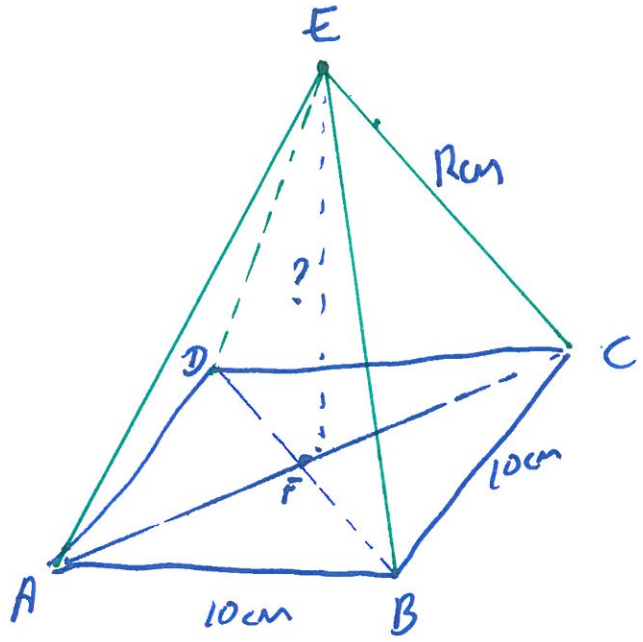
$AB^2 = 8^2 + \left(\frac{\sqrt{72}}{2}\right)^2$

$= 64 + \frac{72}{4}$

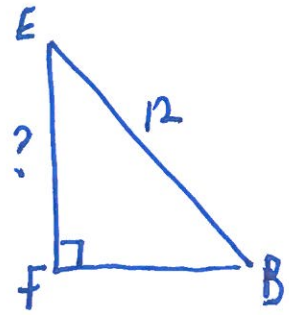
$AB^2 = \sqrt{82}$

$AB = \sqrt{82} = 9.1\text{cm}$

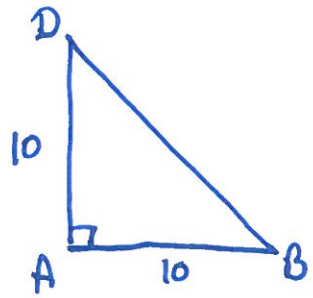
5



Need ΔEFB



From ΔABD



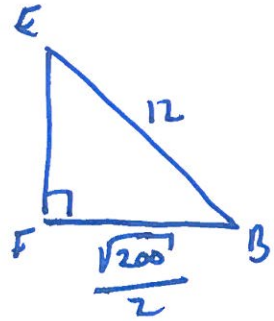
$DB^2 = 10^2 + 10^2$

$= 200$

$DB = \sqrt{200}$

Now $FB = \frac{1}{2} DB = \frac{\sqrt{200}}{2}$

So in ΔEFB



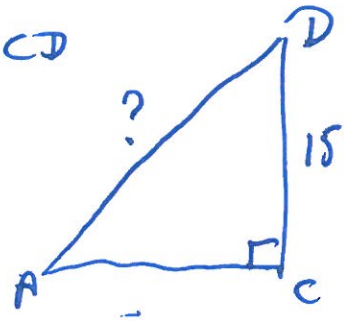
$EF^2 = 12^2 - \left(\frac{\sqrt{200}}{2}\right)^2$

$= 144 - \frac{200}{4}$

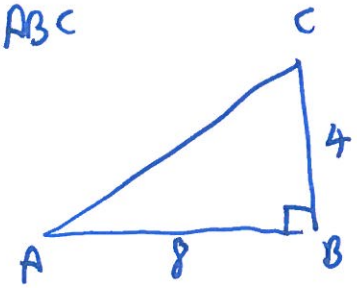
$= 94$

$EF = \sqrt{94} = 9.7\,cm$

(6) (a) Need $\triangle ACD$



Use $\triangle ABC$



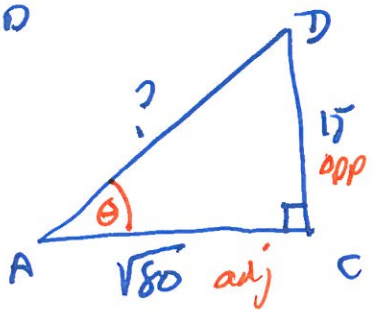
$AC^2 = 8^2 + 4^2$

$= 64 + 16$

$= 80$

$AC = \sqrt{80}$

In $\triangle ACD$



$AD^2 = 15^2 + (\sqrt{80})^2$

$= 225 + 80$

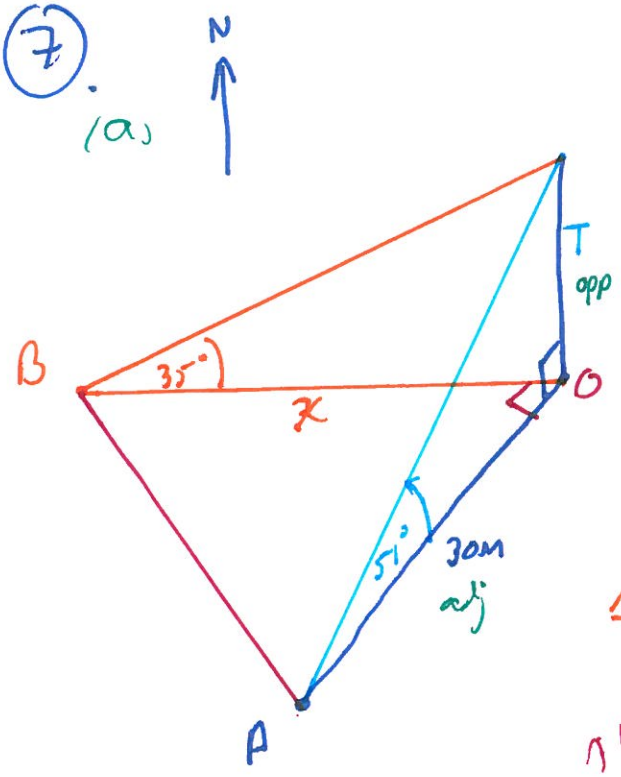
$AD = \sqrt{305} = 17.5 \text{ cm}$

(b) $\tan\theta = \frac{15}{\sqrt{80}}$

$\theta = \tan^{-1}\left(\frac{15}{\sqrt{80}}\right) = 59.2^\circ$

7.

(a)



$\frac{T}{30} = \tan 51^\circ$

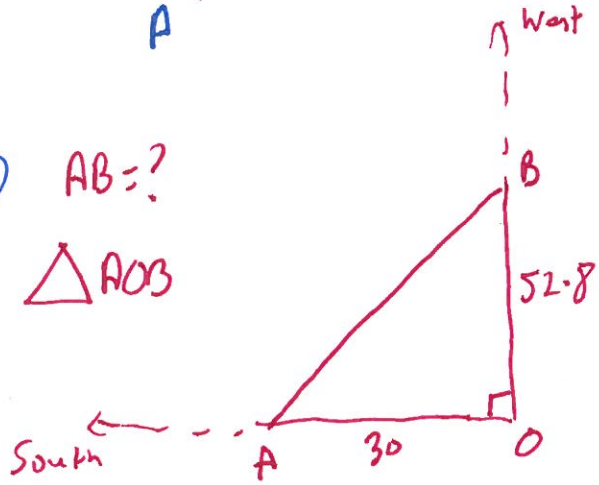
$T = 30 \tan 51^\circ$

$= 37.0\text{m}$

$x = \frac{37}{\tan 35} = 52.8\text{M}$

(c) AB = ?

$\triangle AOB$

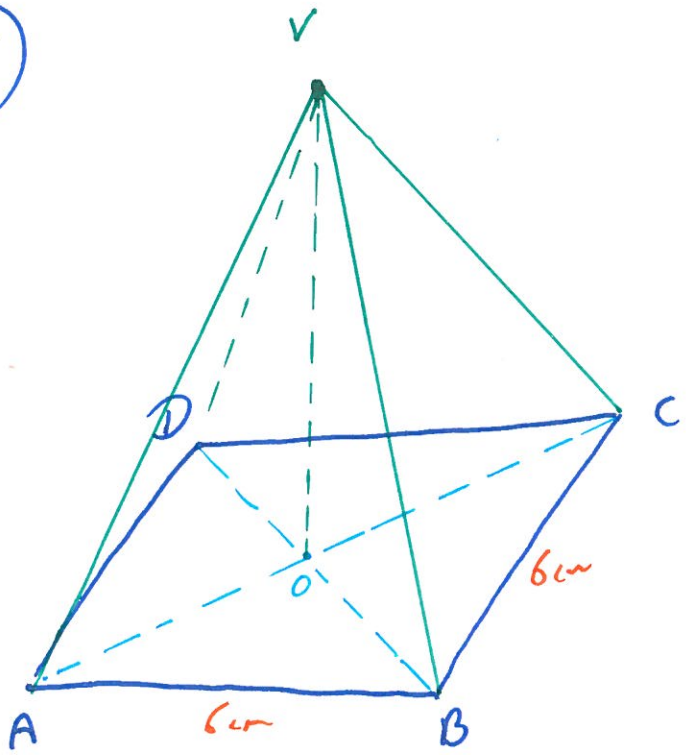


$AB^2 = 30^2 + 52.8^2$

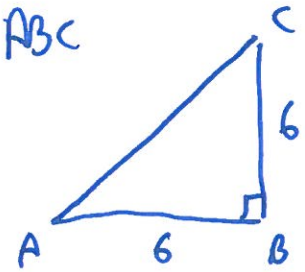
$= 3692.2$

$AB = \sqrt{3692.2} = 60.8\text{M}$

8



(a) $\triangle ABC$



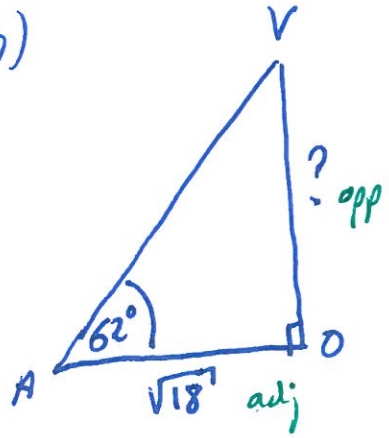
$AC^2 = 6^2 + 6^2$

$= 72$

$AC = \sqrt{72}$

Now $AO = \frac{AC}{2} = \frac{\sqrt{72}}{2} = 3\sqrt{2} = \sqrt{18}$

(b)



$VO = \tan(62) \times \sqrt{18}$

$= 8.0$ cm

(c) $VA = ?$

$VA^2 = (\sqrt{18})^2 + (8.0)^2$

$= 81.7$

$VA = \sqrt{81.7}$

$= 9.0$ cm