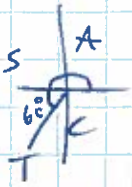
see pg. 3 for #7

Pg. 348 #3.

a) $\sin 30^\circ = \frac{1}{2}$

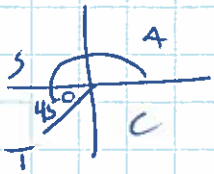
b) $\tan 315^\circ = -\tan 45^\circ = -1$

c) $\cos 240^\circ = -\cos 60^\circ = -\frac{1}{2}$



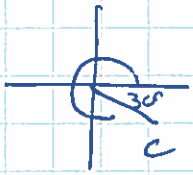
d) $\tan 150^\circ = -\tan 30^\circ = -\frac{1}{\sqrt{3}}$

e) $\cos 225^\circ = -\cos 45^\circ = -\frac{1}{\sqrt{2}}$



f) $\sin 45^\circ = \frac{1}{\sqrt{2}}$

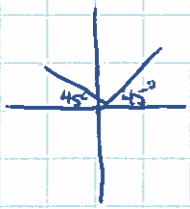
g) $\cos 330^\circ = \cos 30^\circ = \frac{\sqrt{3}}{2}$



h) $\sin 300^\circ = -\sin 60^\circ = -\frac{\sqrt{3}}{2}$

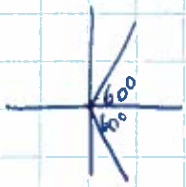
11 a) $\sin A = \frac{1}{\sqrt{2}}$

$A = 45^\circ, 180^\circ - 45^\circ = 135^\circ$



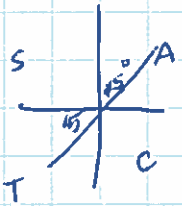
b) $\cos A = \frac{1}{2}$

$A = 60^\circ, 300^\circ$



c) $\tan A = 1$

$A = 45^\circ, 180^\circ + 45^\circ = 225^\circ$

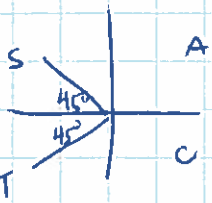


d) $\sin A = \frac{\sqrt{3}}{2}$

$A = 60^\circ, 180^\circ - 60^\circ = 120^\circ$

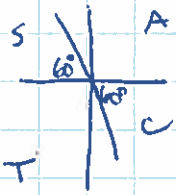
e) $\cos A = -\frac{1}{\sqrt{2}}$

$A = 180^\circ - 45^\circ, 180^\circ + 45^\circ = 135^\circ, 225^\circ$



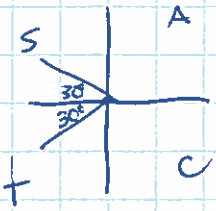
f) $\tan A = -\sqrt{3}$

$A = 120^\circ, 300^\circ$



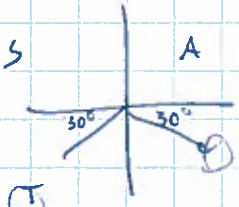
g) $\cos A = -\frac{\sqrt{3}}{2}$

$A = 150^\circ, 210^\circ$



h) $\sin A = -\frac{1}{2}$

$A = 210^\circ, 330^\circ$



i) $\tan A = -1$

$A = 180^\circ - 45^\circ, 360^\circ - 45^\circ = 135^\circ, 315^\circ$

j) $\tan A = -\frac{1}{\sqrt{3}}$

$A = 180^\circ - 30^\circ, 360^\circ - 30^\circ = 150^\circ, 330^\circ$

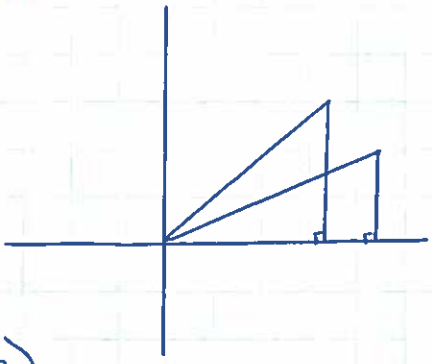
k) $\cos A = -\frac{1}{2}$

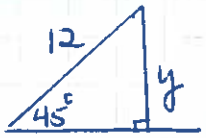
$A = 180^\circ - 60^\circ, 180^\circ + 60^\circ = 120^\circ, 240^\circ$

Pg. 348 #5, 8

#5

a)





$\sin 30° = \frac{y_2}{12}$

$y_2 = 12\sin 30°$

$y_2 = 12\left(\frac{1}{2}\right)$

$y_2 = 6$

$\sin 45° = \frac{y_1}{12}$

$y_1 = 12\sin 45°$

$y_1 = 12\left(\frac{1}{\sqrt{2}}\right)$

$y_1 = \frac{12}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{12\sqrt{2}}{2}$

$= 6\sqrt{2}$

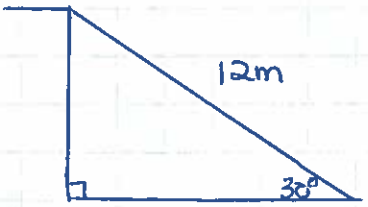
(exact) ∴ the vertical displacement is $6\sqrt{2} - 6$ ~~units~~ metres.

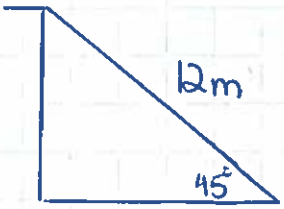
(approx) b) $6\sqrt{2} - 6$

$\doteq 2.5$ m.

#8

a)





x_1

$\cos 30° = \frac{x_1}{12}$

$x_1 = 12\cos 30°$

$= 12\left(\frac{\sqrt{3}}{2}\right)$

$= 6\sqrt{3}$

x_2

$\cos 45° = \frac{x_2}{12}$

$x_2 = 12\cos 45°$

$= 12\left(\frac{1}{\sqrt{2}}\right) \times \frac{\sqrt{2}}{\sqrt{2}}$

$= 6\sqrt{2}$

(exact) ∴ horizontal change is $6\sqrt{3} - 6\sqrt{2}$ metres

b) $6\sqrt{3} - 6\sqrt{2}$

(approx.) $\doteq 1.9$ metres.

#8b (same as ~~#5~~)

from diagram in 8(a) ... find y_1, y_2

$\sin 30° = \frac{y_1}{12}$

$y_1 = 12 \sin 30°$

$= 12(\frac{1}{2})$

$= 6$

$\sin 45° = \frac{y_2}{12}$

$y_2 = 12 \sin 45°$

$= \frac{12}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

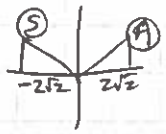
$= 6\sqrt{2}$

$\therefore$ Change in height is $6\sqrt{2} - 6$ metres (exact)

or approximately 2.5 m.

#7 bcf

#7b) $\sin\theta = \frac{1}{3} \leftarrow y \leftarrow r$



$x^2 = r^2 - y^2$

$x^2 = 9 - 1$

$x^2 = 8$

$x = \pm\sqrt{8}$

$x = \pm 2\sqrt{2}$

$\cos\theta = \frac{2\sqrt{2}}{3}$ or $\cos\theta = \frac{-2\sqrt{2}}{3}$

$\tan\theta = \frac{1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ (OR) $\tan\theta = \frac{-1}{2\sqrt{2}}$

$\tan\theta = \frac{\sqrt{2}}{4}$ (OR) $\tan\theta = \frac{-\sqrt{2}}{4}$

c) $\tan\theta = \frac{1}{4} \leftarrow y \leftarrow x$

$r = \sqrt{1+16}$

$r = \sqrt{17}$

In Quad I:

$\sin\theta = \frac{1}{\sqrt{17}}$

$\cos\theta = \frac{4}{\sqrt{17}}$

In Quad III:

$\sin\theta = \frac{-1}{\sqrt{17}}$

$\cos\theta = \frac{-4}{\sqrt{17}}$.

~~f~~) $\sin\theta = \frac{-5}{6}$

$r = 6, y = -5$

$x^2 = 36 - 25$

$x^2 = 11$

$x = \pm\sqrt{11}$

In Quad III:

$\cos\theta = \frac{-\sqrt{11}}{6}$

$\tan\theta = \frac{5}{\sqrt{11}}$

In Quad IV,

$\cos\theta = \frac{\sqrt{11}}{6}$

$\tan\theta = \frac{-5}{\sqrt{11}}$