SOH CAH TOA

Name: _____ Date: KEY

7.0 - Right Triangle Trigonometry Worksheet

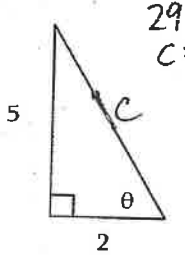
1) Find the hypotenuse for each triangle, then find the three trig ratios as a fraction and decimal (to the nearest thousandth) for each triangle. Then find the unknown angle for each (to the nearest degree).

a) $5^2 + 2^2 = c^2$

$25 + 4 = c^2$

$29 = c^2$

$c = \sqrt{29}$



$\tan\theta = \frac{5}{2} = 2.5$

$\sin\theta = \frac{5}{\sqrt{29}} = 0.928$

$\cos\theta = \frac{2}{\sqrt{29}} = 0.371$

$\angle\theta = \cos^{-1}(0.371)$

$\angle\theta = 68°$

b) $5^2 + 4^2 = c^2$

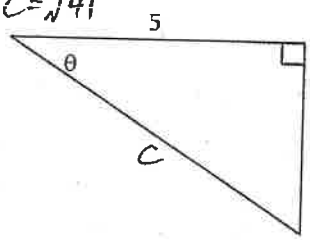
$25 + 16 = c^2$

$41 = c^2$

$c = \sqrt{41}$

$\tan\theta = \frac{4}{5} = 0.8$

$\sin\theta = \frac{4}{\sqrt{41}} = 0.625$



$\cos\theta = \frac{5}{\sqrt{41}} = 0.781$

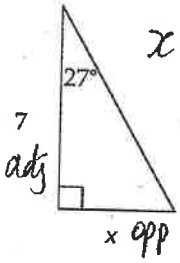
$\angle\theta = \cos^{-1}(0.781)$

$\angle\theta = 39°$

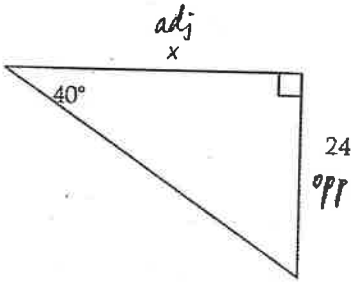
2) Find x to the nearest tenth.

a) $(\tan 27° = \frac{x}{7})^{\times 7}$

$x = 3.6$



b)

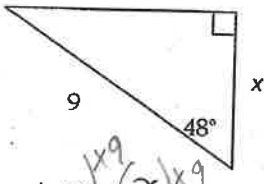


$\tan 40° = \frac{24}{x}$

$x = \frac{24}{\tan 40°}$

$x = 28.6$

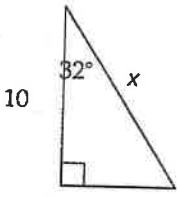
c)



$(\cos 48° = \frac{x}{9})^{\times 9}$

$x = 6.0$

d)



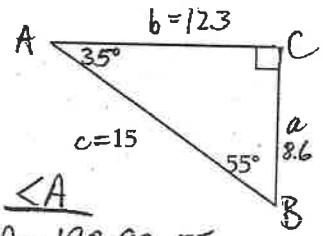
$\cos 32° = \frac{10}{x}$

$x = \frac{10}{\cos 32°}$

$x = 11.8$

3) Solve the following triangles to the nearest tenth.

a)



$\angle A = 180 - 90 - 55$

$= 35°$

side a

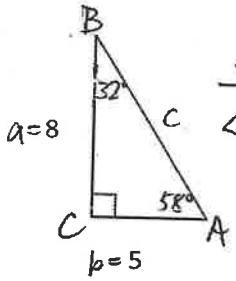
$\sin 35° = \frac{a}{15}$ $\times 15$, $a = 8.6$

side b

$\sin 55° = \frac{b}{15}$ $\times 15$

$b = 12.3$

b)



$\angle A$

$\tan A = \frac{8}{5}$, $\angle A = \tan^{-1}\left(\frac{8}{5}\right)$

$\angle A = 58°$

$\angle B$

$\angle B = 180 - 90 - 58 = 32°$

side c

$a^2 + b^2 = c^2$

$8^2 + 5^2 = c^2$

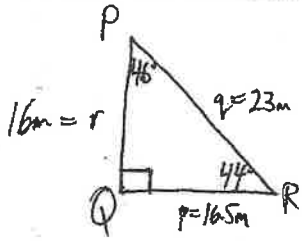
$64 + 25 = c^2$

$89 = c^2$

$c = \sqrt{89}$

$c = 9.4$

4) Sketch and solve ΔPQR: $\angle P = 46°$, $\angle Q = 90°$, & $q = 23$m



$\angle R$

$\angle R = 180 - 90 - 46°$

$= 44°$

side r

$\cos 46° = \frac{r}{23}$ $\times 23$

$r = 16$m.

side p

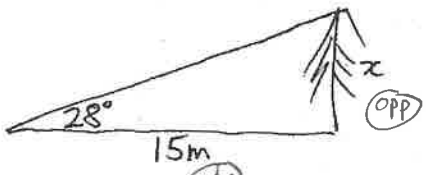
$\sin 46° = \frac{p}{23}$ $\times 23$

$p = 16.5$m

5) From 15m away, the angle of elevation to the top of a tree is 28°. How tall is the tree to the nearest hundredth?

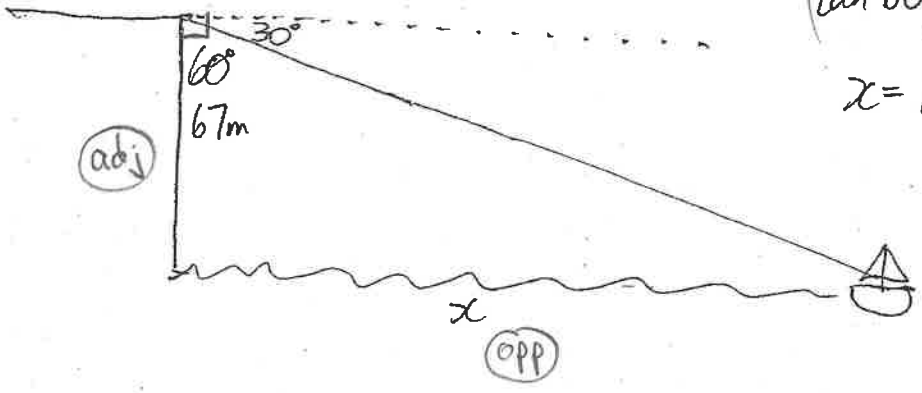
$\tan 28° = \frac{x}{15}$ $\times 15$

$x = 7.98$m



The tree is 7.98m high.

6) From the top of a 67m cliff, the angle of depression to a sailboat is 30°. How far from the base of the cliff is the boat to the nearest tenth?



$\tan 60° = \frac{x}{67}$ $\times 67$

$x = 116$m.

The boat is 116m from the base of the cliff.