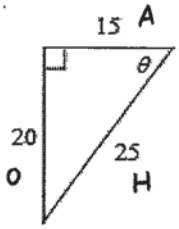
Name: _____ **Chapter 2 Practice Test – Trigonometry**

$$\sin\theta = \frac{O}{H} \qquad \cos\theta = \frac{A}{H} \qquad \tan\theta = \frac{O}{A} \qquad a^2 + b^2 = c^2$$

Show all of your work for full marks.

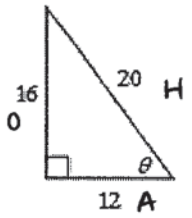
1. Find the value of the **trig ratio** indicated. Express your answer as a fraction (simplified, if necessary).

a) $\cos\theta$



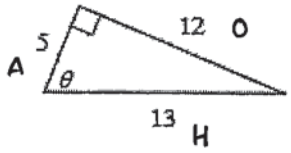
$\cos\theta = \frac{15}{25} = \frac{3}{5}$

b) $\sin\theta$



$\sin\theta = \frac{16}{20} = \frac{4}{5}$

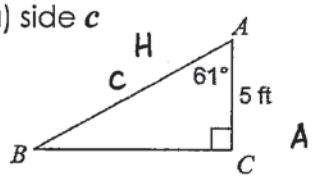
c) $\tan\theta$



$\tan\theta = \frac{12}{5}$

2. Find the measure of the indicated **side**. Round your final answer to the nearest tenth.

a) side c

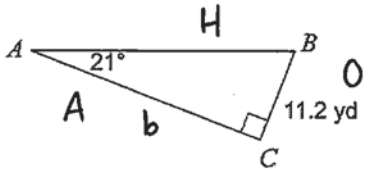


$\cos 61 = \frac{5}{c}$

$c = \frac{5}{\cos 61} = \frac{5}{0.4848} = 10.313$

$c = 10.3$ ft

b) side b

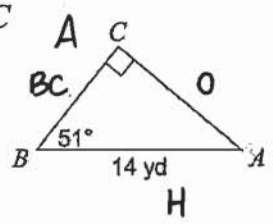


$\tan 21 = \frac{11.2}{b}$

$b = \frac{11.2}{\tan 21} = \frac{11.2}{0.3839} = 29.177$

$b = 29.2$ yd

c) side BC



$\cos 51 = \frac{BC}{14}$

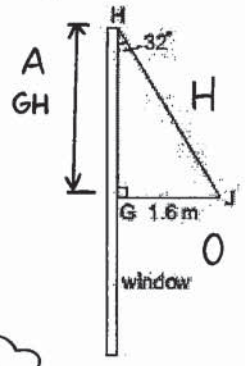
$BC = 14\cos 51$

$= 14(0.6293)$

$= 8.810$

BC = 8.8yd

3. This diagram shows an awning over the window of a house. Find the height of the awning, GH, to the nearest tenth of a meter.



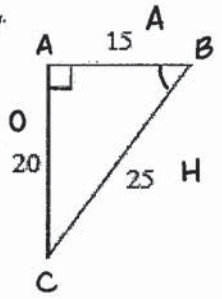
$\tan 32 = \frac{1.6}{GH}$

$GH = \frac{1.6}{\tan 32} = \frac{1.6}{0.6249} = 2.561$

GH = 2.6m

4. Find the measure of each **angle** indicated. Round your final answer to the nearest degree.

a) $\angle ABC$



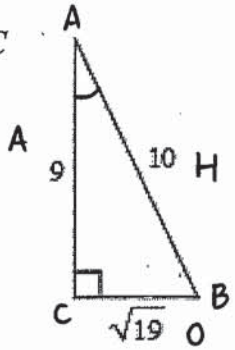
$\sin B = \frac{20}{25}$ or $\cos B = \frac{15}{25}$ or $\tan B = \frac{20}{15}$

$\angle B = \sin^{-1}(0.8)$

$= 53.13$

$\angle B = 53°$

b) $\angle BAC$



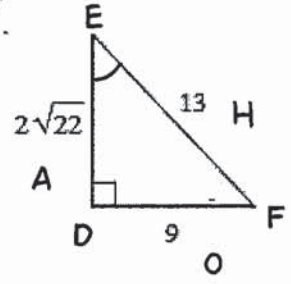
$\cos A = \frac{9}{10}$

$\angle A = \cos^{-1}(0.9)$

$= 25.842$

$\angle A = 26°$

c) $\angle DEF$



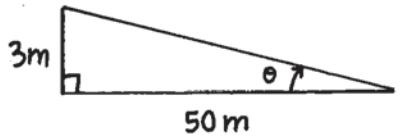
$\sin E = \frac{9}{13}$

$\angle E = \sin^{-1}(0.6923)$

$= 43.81$

$\angle E = 44°$

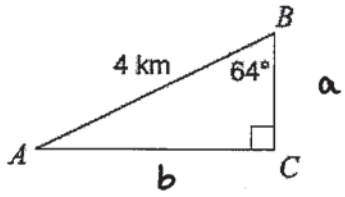
5. Victor is building a wheelchair ramp to an entranceway that is 3 m above the sidewalk. The ramp will cover a horizontal distance of 50 m. What angle, to the nearest degree, will the ramp make with the ground?



$\theta = \tan^{-1}\left(\frac{3}{50}\right) = 3.43°$ $\theta = 3°$

6. **Solve** the following right triangles. Give lengths to the nearest tenth and angles to the nearest degree.

a)



$\angle A = 180° - 90° - 64° = 26°$

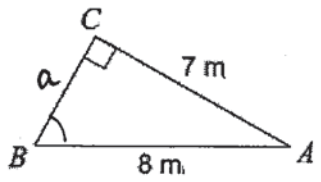
$\cos 64 = \frac{a}{4}$ $\sin 64 = \frac{b}{4}$

$a = 4 \cdot \cos 64$ $b = 4 \cdot \sin 64$

$= 1.753$ km $= 3.595$ km

$a = 1.8$ km $b = 3.6$ km

b)



$a^2 + 7^2 = 8^2$

$a^2 = 64 - 49$

$\sqrt{a^2} = \sqrt{15}$

$a = 3.873$

$a = 3.9$ m

$\angle A = \cos^{-1}\left(\frac{7}{8}\right)$

$= 28.955$

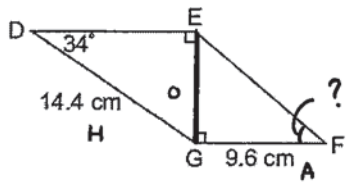
$\angle A = 29°$

$\angle B = \sin^{-1}\left(\frac{7}{8}\right)$

$= 61.04°$

$\angle B = 61°$

7. Find the measure of $\angle F$ to the nearest degree.



$\sin 34 = \frac{EG}{14.4}$

$EG = 14.4 \sin 34$

$= 8.0524$ cm

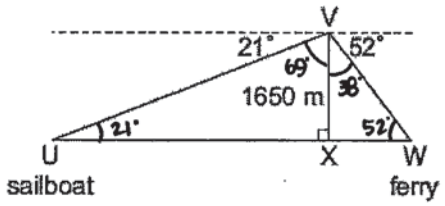
$\tan F = \frac{8.0524}{9.6}$

$\angle F = \tan^{-1}(0.8388)$

$= 39.99°$

$\angle F = 40°$

8. From a small plane, V, the angle of depression of a sailboat is 21°. The angle of depression of a ferry on the other side of the plane is 52°.
The plane is flying at an altitude of 1650 m.
How far apart are the boats, to the nearest meter?



$UW = ?$

$\tan 21 = \frac{1650}{UX}$

$UX = \frac{1650}{\tan 21}$

$= 4298.3970$ m

$\tan 52 = \frac{1650}{XW}$

$XW = \frac{1650}{\tan 52}$

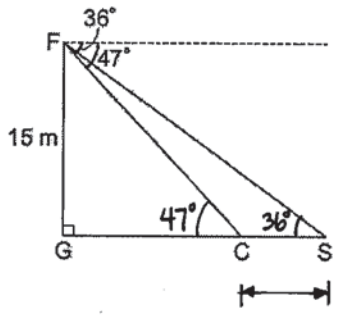
$= 1289.1213$

$UW = 4298.3970 + 1289.1213$

$= 5587.5183$

$UW = 5588$ m

9. The diagram shows a falcon, F, on a tree, with a squirrel, S, and a chipmunk, C, on the ground. From the falcon, the angles of depression of the animals are 36° and 47°.
How far apart are the animals on the ground to the nearest tenth of a meter?



$\tan 47 = \frac{15}{GC}$

$GC = \frac{15}{\tan 47}$

$= 13.9877$

$\tan 36 = \frac{15}{GS}$

$GS = \frac{15}{\tan 36}$

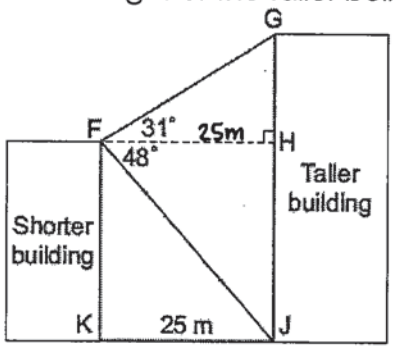
$= 20.6457$

$CS = 20.6457 - 13.9877$

$CS = 6.658\ m$

$CS = 6.7m$

10. Two buildings are 25 m apart. From the top of the shorter building, the angles of elevation and depression of the top and bottom of the taller building are 31 and 48 respectively.
What is the height of the taller building? Give your answer to the nearest meter.



$GJ = ?$

$\tan 48 = \frac{HJ}{25}$

$HJ = 25 \cdot \tan 48$

$= 27.765$

$\tan 31 = \frac{HG}{25}$

$HG = 25 \cdot \tan 31$

$= 15.022$

$GJ = 27.765 + 15.022$

$= 42.787\ m$

$GJ = 43\ m$