Trig Ratios:

$$\sin \theta = \frac{opp}{Hyp} \qquad \cos \theta = \frac{adj}{Hyp} \qquad \tan \theta = \frac{opp}{adj}$$

Finding missing sides:
- If x flies high... multiply
- If x is on the bottom... swap'm & divide
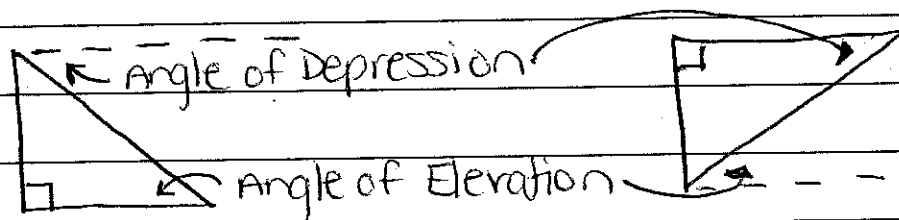
Finding missing angles:
- use inverse trig function
- ex. [2nd] sin is $\sin^{-1}\left(\frac{\#}{\#}\right)$

Pythagorean theorem $\qquad a^2 + b^2 = c^2$
- use to find 3rd side of a $\triangle$

Other Properties:
- $\cos A = \sin B$
- $\cos A = \sin (90 - A)$
- $\sin A = \cos (90 - A)$

Angle of Depression
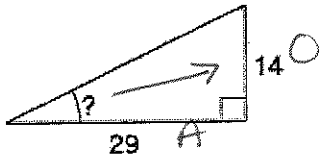
Angle of Elevation

Angle of Elevation & Depression have same measures

TRIG BASICS

Find the missing side or angle:

1.
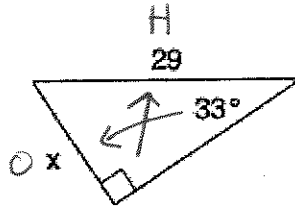
$\tan \theta = \frac{O}{A}$

$\tan \theta = \frac{14}{29}$

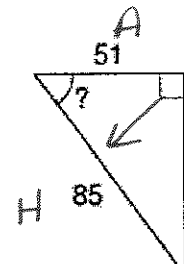$\tan^{-1}\left(\frac{14}{29}\right)$

$\theta = \boxed{25.769°}$

2.

$\sin 33 = \frac{O}{H}$

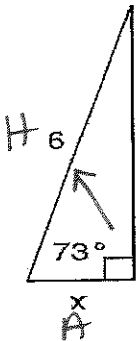$\sin 33 = \frac{x}{29}$

$x = 29 \sin 33$

$x = \boxed{15.795}$

3.

$\cos \theta = \frac{A}{H}$

$\cos \theta = \frac{51}{85}$

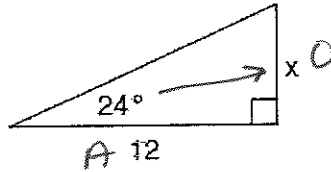$\cos^{-1}\left(\frac{51}{85}\right) =$

$\theta = \boxed{53.130°}$

4.

$\cos 73 = \frac{A}{H}$

$\cos 73 = \frac{x}{6}$
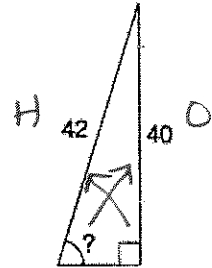
$x = 6 \cos 73$

$x = \boxed{1.754}$

5.

$\tan 24 = \frac{O}{A}$

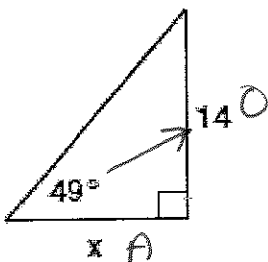$\tan 24 = \frac{x}{12}$

$x = 12 \tan 24$

$x = \boxed{5.343}$

6.

$\sin \theta = \frac{O}{H}$

$\sin \theta = \frac{40}{42}$

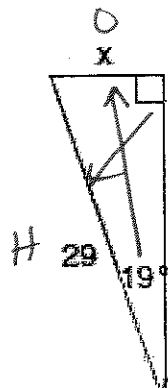$\sin^{-1}\left(\frac{40}{42}\right)$

$\theta = \boxed{72.247°}$

7.

$\tan 49 = \frac{O}{A}$

$\tan 49 = \frac{14}{x}$
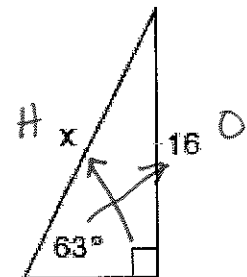
$x = \frac{14}{\tan 49}$

$x = \boxed{12.170}$

8.

$\sin 19 = \frac{O}{H}$

$\sin 19 = \frac{x}{29}$
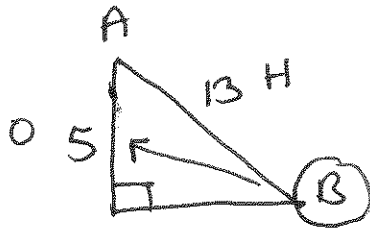
$x = 29 \sin 19$

$x = \boxed{9.441}$

9.

$\sin 63 = \frac{16}{x}$

$x = \frac{16}{\sin 63}$

$x = \boxed{17.957}$
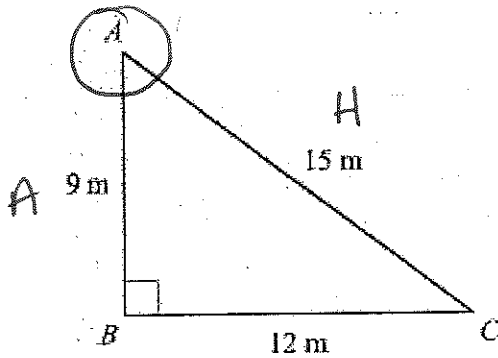
UNIT 2 – EOCT Review   Name: _____

1. In right triangle ABC, angle A and angle B are complementary angles. The value of $\cos A$ is $\frac{5}{13}$. What is the value of $\sin B$?

$$\sin B = \frac{O}{H} = \frac{5}{13}$$

A. $\frac{5}{13}$

B. $\frac{12}{13}$

C. $\frac{13}{12}$

D. $\frac{13}{5}$

2. Triangle ABC is given below.

What is the value of $\cos A$? $\frac{A}{H}$

A. $\frac{3}{5}$

B. $\frac{3}{4}$

C. $\frac{4}{5}$

D. $\frac{5}{3}$

$$= \frac{9}{15} = \frac{3}{5}$$

3. In right triangle HJK, $\angle J$ is a right angle and $\tan \angle H = 1$. Which statement about triangle HJK must be true?

A. $\sin \angle H = \frac{1}{2}$ $\frac{O}{H}$

B. $\sin \angle H = 1$ $\frac{1}{\sqrt{2}}$

C. $\sin \angle H = \cos \angle H$ $\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

D. $\sin \angle H = \frac{1}{\cos \angle H}$
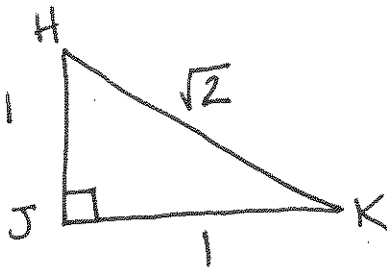
$$\tan H = \frac{O}{A} = 1$$

$$1^2 + 1^2 = c^2$$

$$2 = c^2$$

$$\sqrt{2} = c$$

4. A 12-foot ladder is leaning against a building at a 75° angle with the ground.
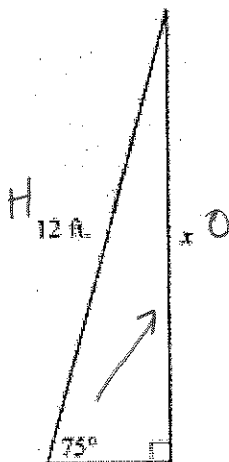
Which can be used to find how high the ladder reaches up the side of the building?

A. $\sin 75° = \dfrac{12}{x}$

B. $\tan 75° = \dfrac{12}{x}$

C. $\cos 75° = \dfrac{x}{12}$

D. $\sin 75° = \dfrac{x}{12}$

$\sin 75 = \dfrac{O}{H}$

$\sin 75 = \dfrac{X}{12}$

5. A hot air balloon is 1200 feet above the ground. The angle of depression from the basket of the hot-air balloon to the base of a monument is 54°.
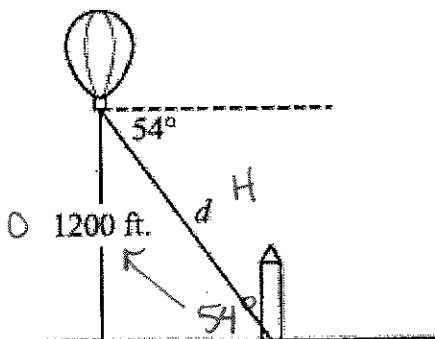
Which equation can be used to find the distance, d, in feet, from the basket of the hot-air balloon to the base of the monument?

$\sin 54 = \dfrac{1200}{d}$

A. $\sin 54° = \dfrac{d}{1200}$

B. $\sin 54° = \dfrac{1200}{d}$

C. $\cos 54° = \dfrac{d}{1200}$

D. $\cos 54° = \dfrac{1200}{d}$

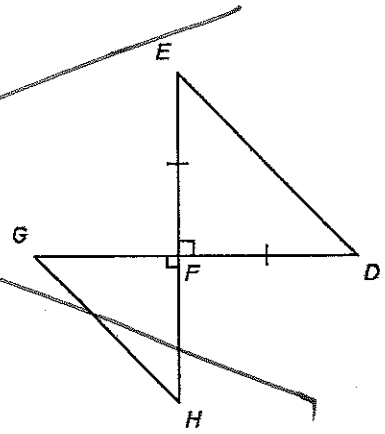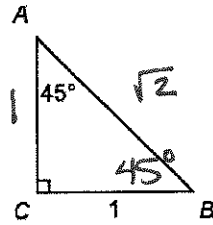**6.** In the figure below, $\square DEF \sim \square GHF$. Which statements are true?

(A) $\dfrac{FD}{EF} = \dfrac{FG}{HF}$ (D) $\dfrac{DE}{FD} = \sqrt{2}$

(B) $\dfrac{HF}{FG} = 1$ (E) $\dfrac{DE}{EF} = \dfrac{GH}{HF}$

(C) $\dfrac{FD}{FG} = 1$ (F) $\dfrac{FD}{DE} = \dfrac{GH}{FG}$

7. Use the figure shown to determine which of the statements below are true.
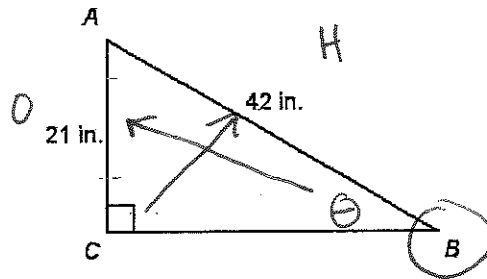
(A) $\sin A = \cos B$ $\dfrac{1}{\sqrt{2}} = \dfrac{1}{\sqrt{2}}$

(B) $\sin A = \cos A$ $\dfrac{1}{\sqrt{2}} = \dfrac{1}{\sqrt{2}}$

(C) $\cos A = 1$ $\dfrac{1}{\sqrt{2}}$

(D) $\sin B = \cos A$ $\dfrac{1}{\sqrt{2}} = \dfrac{1}{\sqrt{2}}$

(E) $\sin A = \dfrac{\sqrt{2}}{2}$ $\dfrac{1}{\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}} = \dfrac{\sqrt{2}}{2}$

just like #3

8. A ramp that is being constructed must be 42 inches long and reach a ledge that is 21 inches tall. Which inverse trigonometric ratio could be used to find $m\angle B$?

(A) $\sin^{-1}\left(\dfrac{21}{42}\right)$

(B) $\sin^{-1}\left(\dfrac{42}{21}\right)$

(C) $\cos^{-1}\left(\dfrac{21}{42}\right)$

(D) $\sin^{-1}\left(\dfrac{21\sqrt{3}}{42}\right)$

$\sin\theta = \dfrac{21}{42}$

$\sin^{-1}\left(\dfrac{21}{42}\right)$

Constructed Response:

9. Priya has planted a garden shaped like a right triangle. One leg of the triangle is 5 meters long, and the angle formed by it and the hypotenuse is 50°. If Priya wants to build a fence around her garden, how many meters of fence will she need? Round your answer to the nearest tenth.
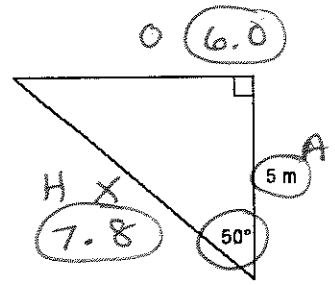
O (6.0)

$\cos 50 = \dfrac{5}{x}$ $\tan 50 = \dfrac{x}{5}$

$x = \dfrac{5}{\cos 50}$ $x = 5 \tan 50$

$x = 7.8$ $x = 6.0$

$\begin{array}{r} 6.0 \\ + 7.8 \\ + 5.0 \\ \hline (18.8\,m) \end{array}$

H X

(7.8) $50°$ $5\,m$ A

Priya will need 18.8 m of fence around her garden.

10. A shelf extends perpendicularly 26 cm from a wall. You want to place a 32 cm brace under the shelf, as shown below.

A Shelf 26 cm B

32 cm Brace H $?$ Wall C
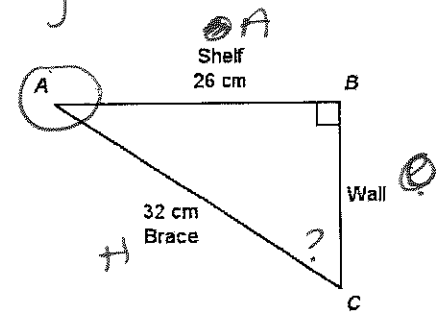
a. To the nearest tenth of a centimeter, how far below the shelf should the brace be attached to the wall? Show your work.

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

$26^2 + b^2 = 32^2$

$676 + b^2 = 1024$

$\begin{array}{r} -676 \qquad -676 \\ \hline b^2 = 348 \end{array}$

$b = \sqrt{348}$

$= (18.7\,cm)$

The brace should attached to the wall 18.7 cm below the shelf.

b. To the nearest degree, what angle does the brace make with the wall? Show your work.

$\sin C = \dfrac{26}{32}$

$C = \sin^{-1}\left(\dfrac{26}{32}\right)$

$C = (54°)$

The brace makes a 54° angle with the wall.

c. To the nearest degree, what angle does the brace make with the shelf? Show your work.

$\cos A = \dfrac{26}{32}$

$A = \cos^{-1}(26/32)$

$A = (36°)$

The brace makes a 36° angle with the shelf.