

Unit 7

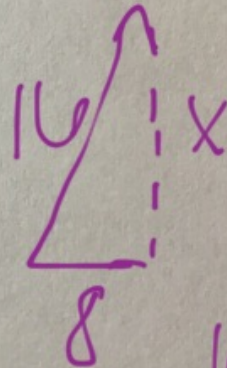
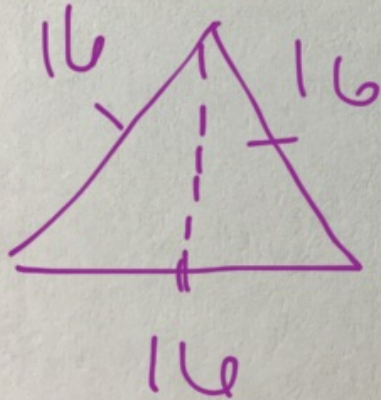
Lesson 5

Angles of Elevation + Depression

Created with Doceri



6. The **perimeter** of an equilateral triangle is 48 inches. What is the height of the triangle?

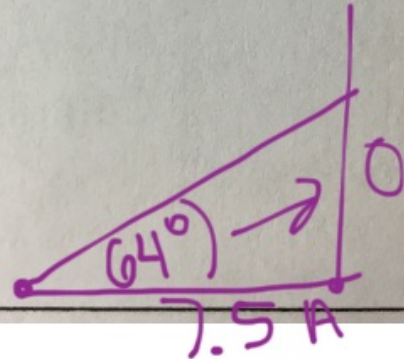


$$16^2 - 8^2 = \sqrt{192}$$

Created with Doceri



18. A ladder leaning against the wall makes an angle of 64° with the ground. If the foot of the ladder is 7.5 feet from the wall, how high on the wall is the ladder?



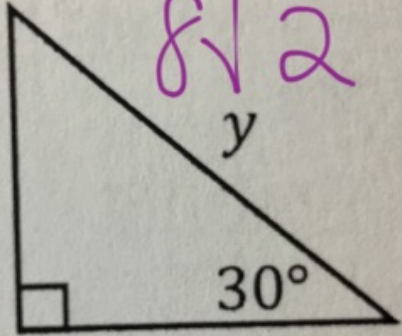
$$\tan(64) = \frac{x}{7.5}$$

$$7.5 \tan(64) = x$$

Created with Doceri



5.

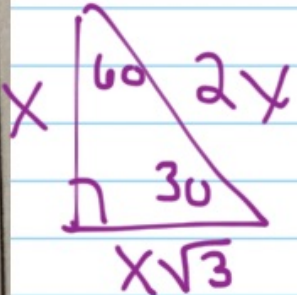


$4\sqrt{2}$ x

$8\sqrt{2}$ y

30°

$4\sqrt{6}$




x 60 $2x$

30

$x\sqrt{3}$

$$\frac{4\sqrt{6}}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$$
$$4\sqrt{2} = x$$

Created with Doceri 


$5\sqrt{2}$
 x
 60°
 $y x$
 $10\sqrt{2}$
 30
 60
 $2x$
 $x\sqrt{3}$
 $5\sqrt{6}$

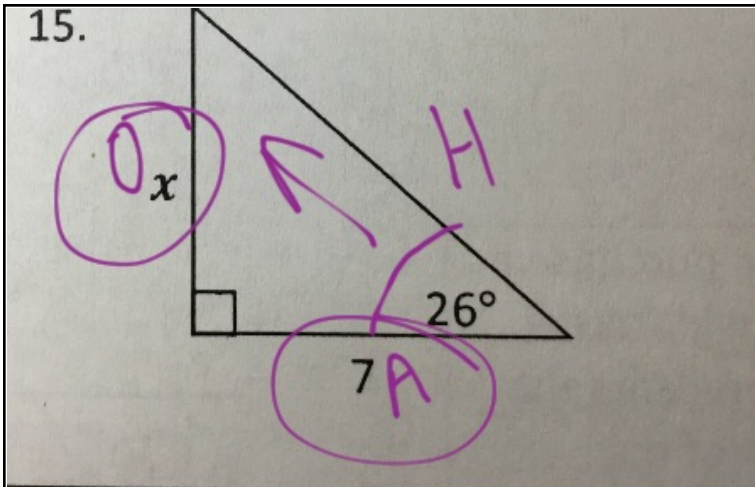
8
 x
 45°
 $y x$
 $8\sqrt{2}$
 45
 45
 $x\sqrt{2}$
 x

$8 = x$

$\frac{5\sqrt{6}}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

$5\sqrt{2} = x$

Created with Doceri 



$$\tan(26) = \frac{x}{7}$$

$$7 \tan(26) = x$$

Created with Doceri

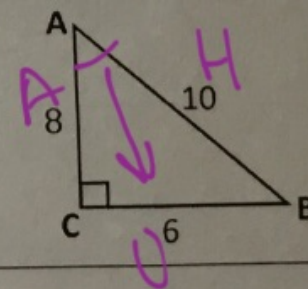


x $4\sqrt{6}$ $y = \underline{\hspace{2cm}}$

6. height = $\underline{\hspace{2cm}}$

III. Use the triangle to the right to write each trigonometric ratio as a fraction (in lowest terms).

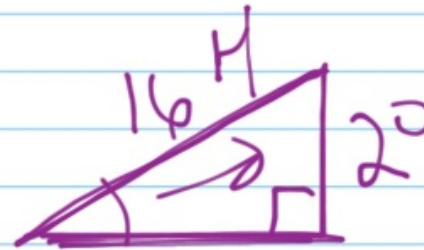
$\sin A = \frac{6}{10} = \frac{3}{5}$	$\sin B = \underline{\hspace{2cm}}$
7. $\cos A = \underline{\hspace{2cm}}$	8. $\cos B = \underline{\hspace{2cm}}$
$\tan A = \underline{\hspace{2cm}}$	$\tan B = \underline{\hspace{2cm}}$



IV. Find the value of each trigonometric function rounded to 4 – decimal places.



22. The length of a ramp is 16 feet. The vertical rise is 2 feet. What is the **angle** the ramp makes with the ground?



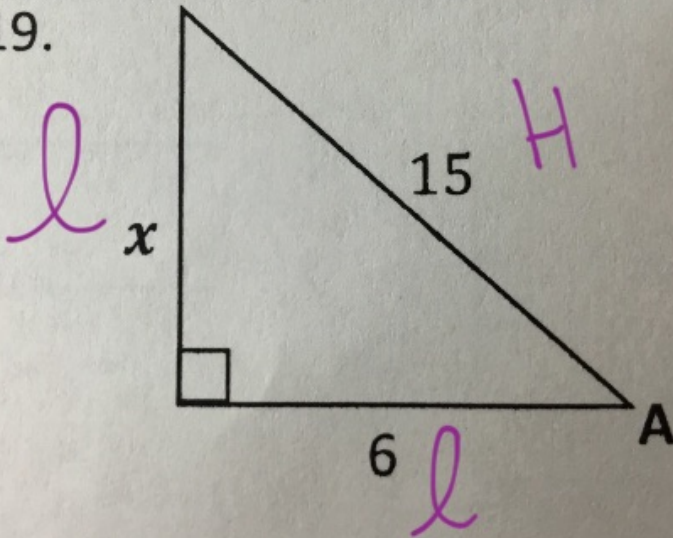
$$\sin^{-1}(2/16)$$

Created with Doceri



VII. Use trigonometric ratios to find
Also, find any missing side lengths in

19.



$$l^2 + l^2 = H^2$$

$$15^2 - 6^2$$

Created with Doceri

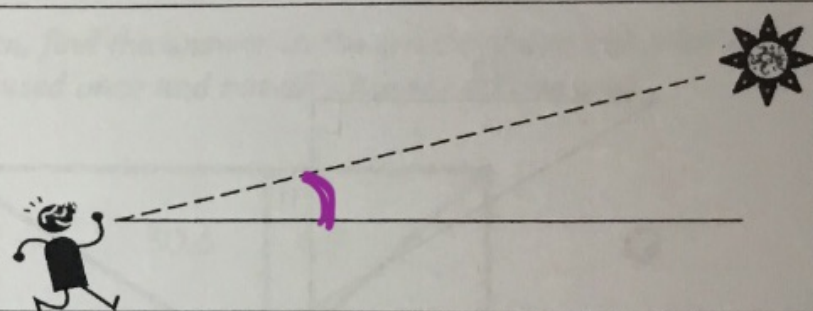


7 – Right Triangle Trigonometry Date _____ Pd _____

Lesson 5 → Angles of Elevation and Depression

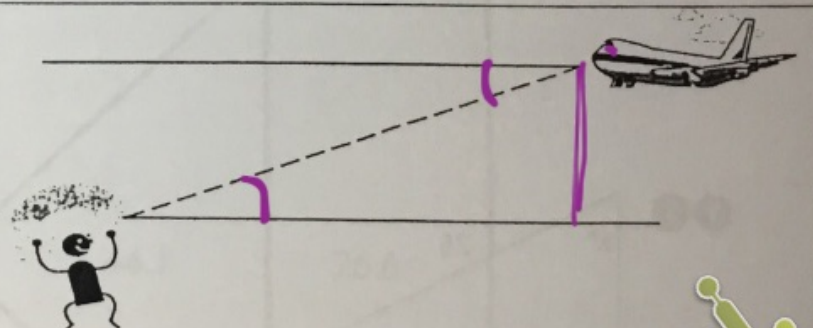
Angle of Elevation


If an observer sights an object, the angle formed between a horizontal line and his or her line of sight is the **angle of elevation**.



Angle of Depression

If an observer in the air sights an object below, the angle formed below the horizontal line and the line of sight is called the **angle of depression**.

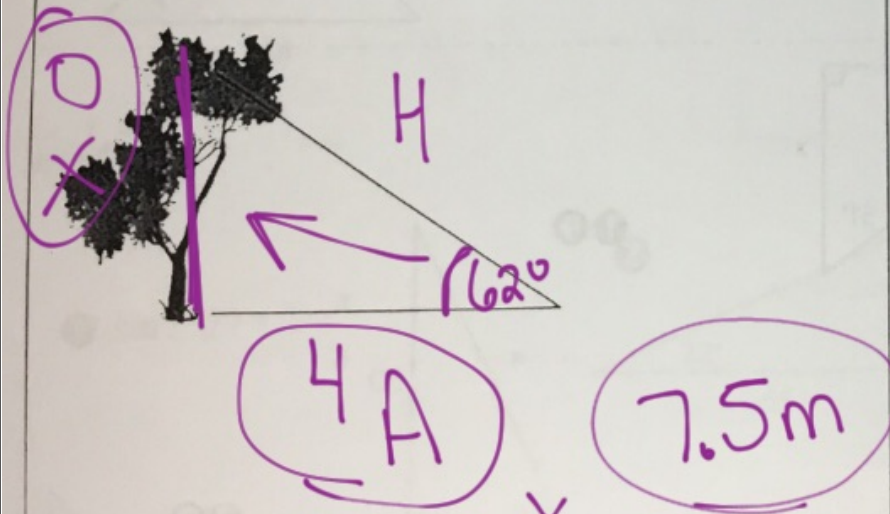


Created with Doceri 

• The Angle of Elevation and the Angle of Depression are ≅ by Alt Angles.

► Examples:

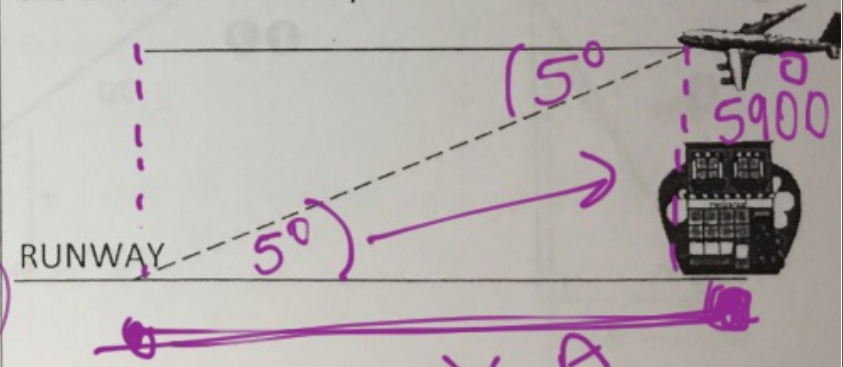
1. From a point on the ground 4.0m from the base of a tree, the angle of elevation to the top of the tree is 62°. Determine the height of the tree.



$$\tan(62) = \frac{x}{4}$$

$$4 \tan(62) = x$$

2. The altimeter of a jet airplane approaching RDU records 5900 ft as it passes over Cracker Barrel on Airport Rd. At the same time the *angle of depression* from the plane to the near end of the runway is 5°. How far is it from the base of the Cracker Barrel to the end of the runway?

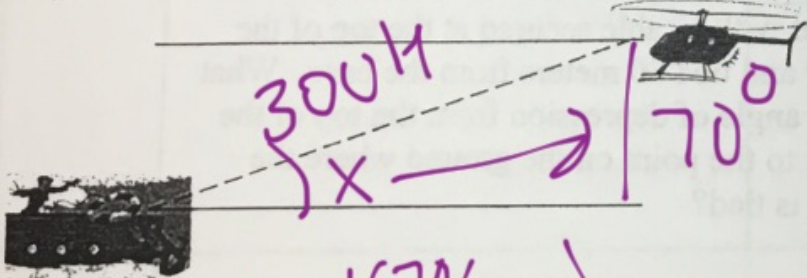


$$\tan(5) = \frac{5900}{x}$$

$$x = \frac{5900}{\tan(5)}$$

Handwritten calculation result: $67,437.3$ ft

3. A stranded boater tries to gain the attention of a rescue helicopter that is 300 ft away. If the helicopter is hovering at 70 ft, what is the angle of depression from the pilot to the boater?



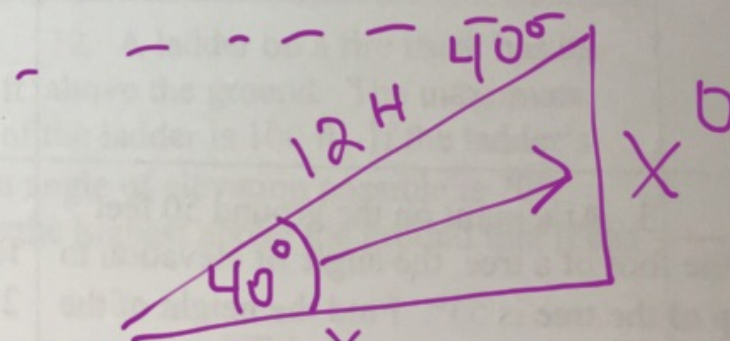
$$\sin^{-1}(70/300)$$

$$\approx 13.5^\circ$$

4. Determine an airplanes altimeter reading if the angle of depression to the runway is 40° when the plane is 12 miles from the runway.



7.7 miles tall
runway



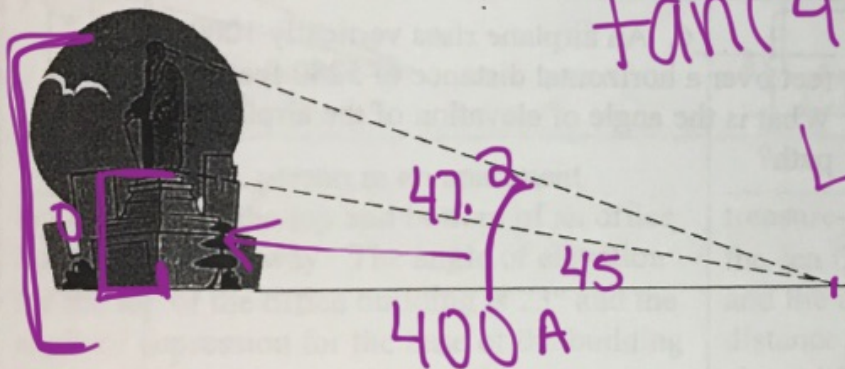
$$\sin(40) = \frac{x}{12}$$

$$12 \sin(40) = x$$

Created with Doceri



5. A statue sits on top of a building. Two observations are taken 400 ft from the building. The angle of elevation to the base of the statue is 45°. The angle of elevation to the top of the statue is 47.2°. What is the height of the statue?



$$\tan(47.2) = \frac{x}{400}$$

$$400 + \tan(47.2) = x$$

$$x = 432 \text{ total height}$$

$$\tan(45) = \frac{0}{400}$$

$$400 \tan(45) = x$$

$$x = 400 \text{ height of base}$$

$$432 - 400$$

$$= 32 \text{ feet}$$

Created with Doceri



30-33

Created with Doceri

