

### Unit 3 Test Review

**Solve each right triangle.**

1.

$\angle A = \underline{58^\circ}$   
 $AB = \underline{22.64}$   
 $BC = \underline{19.2}$

$\tan 32 = \frac{12}{x} \quad x = 19.2$   
 $12^2 + 19.2^2 = c^2$

2.

$\angle A = \underline{29^\circ}$   
 $AB = \underline{22.69}$   
 $AC = \underline{19.85}$

$\cos 61 = \frac{11}{x}$   
 $\sin 61 = \frac{y}{22.7}$

3.

$\angle D = \underline{16.96^\circ}$   
 $\angle E = \underline{73.04^\circ}$   
 $DF = \underline{45.9}$

$48^2 - 14^2 = DF^2$   
 $2108 = DF^2$

4.

$\angle D = \underline{37.3^\circ}$   
 $\angle E = \underline{52.7}$   
 $DE = \underline{52.8}$

5.

$CD = \underline{14.2}$   
 $AB = \underline{48.2}$   
 $AD = \underline{19.6}$   
 $BC = \underline{38.2}$   
 $\angle CAD = \underline{36^\circ}$   
 $\angle B = \underline{24^\circ}$

$\tan 54 = 19.6/x$   
 $\cos 24 = 44/x$   
 $\tan 24 = x/44$

6.

$CA =$   
 $AB =$   
 $AD =$   
 $BD =$   
 $\angle CAD =$   
 $\angle BAC =$

**Find the trigonometric ratios for the right triangles shown below.**

7.

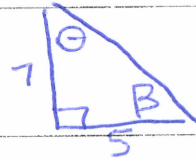
$\sin A = \frac{8}{17}$       $\sin B = \frac{15}{17}$   
 $\cos A = \frac{15}{17}$       $\cos B = \frac{8}{17}$   
 $\tan A = \frac{8}{15}$       $\tan B = \frac{15}{8}$

8.

$\sin Y = \frac{9}{25}$       $\sin S = \frac{16}{25}$   
 $\cos Y = \frac{16}{25}$       $\cos S = \frac{9}{25}$   
 $\tan Y = \frac{9}{16}$       $\tan S = \frac{16}{9}$

9.  $\beta$  and  $\theta$  are complementary angles. If the  $\tan \beta = \frac{7}{5}$  then what is the  $\tan \theta$ ?

$\tan \theta = \frac{5}{7}$



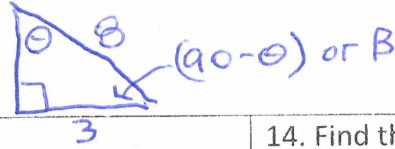
10.  $\beta$  and  $\theta$  are complementary angles. If the  $\sin \theta = \frac{1}{5}$  then what is the  $\cos \beta$ ?

$\cos \beta = \frac{1}{5}$

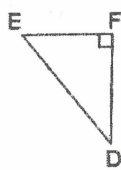
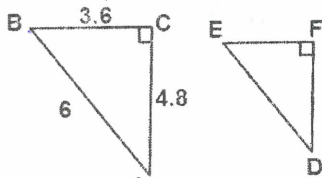


11. The  $\sin \theta = \frac{3}{8}$ . What is the  $\cos(90^\circ - \theta)$ ?

$\cos(90 - \theta) = \frac{3}{8}$

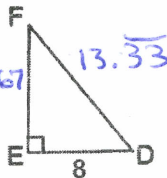
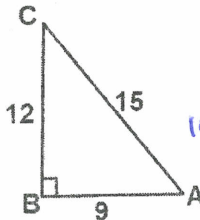


12.  $\Delta ABC \sim \Delta DEF$ . Find the measures of  $\angle E$  and  $\angle D$ .



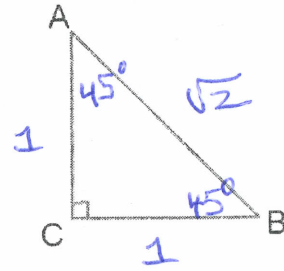
2nd  $\tan^{-1}(\frac{4.8}{3.6})$   
 $\angle B = 53.13^\circ$  so,  $\angle E = 53.13^\circ$   
 $\angle D = 90 - 53.13 = 36.87^\circ$

13.  $\Delta ABC \sim \Delta DEF$ . Find the measures of  $\overline{FD}$  and  $\overline{EF}$ .

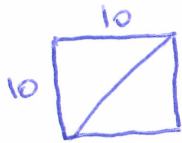


$k = \frac{8}{9}$

14. Find the measures of the acute angles of  $\Delta ABC$  that will result in the  $\cos A = \sin A$



15. Find the exact length of a diagonal of a square with sides 10 in. long.

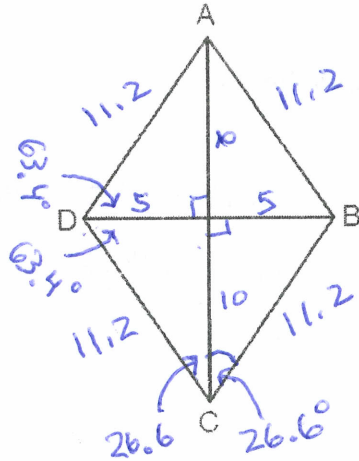


$10^2 + 10^2 = c^2$   
 $100 + 100 = c^2$   
 $14.14 = c$

16. Find the angles of rhombus whose diagonals measure 10 cm and 20 cm.

$\angle C = 53.2^\circ$   
 $\angle D = 126.8^\circ$

2nd  $\tan^{-1}(\frac{10}{5}) = 63.4^\circ$

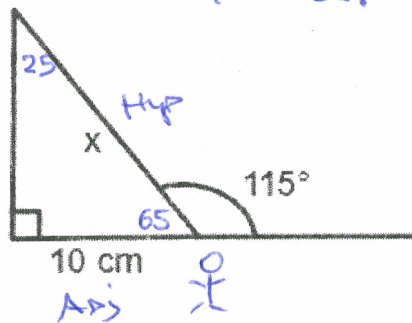


So,  
 $\angle B = 126.8^\circ$   
 and  
 $\angle A = 53.2^\circ$

2nd  $\tan^{-1}(\frac{5}{10}) = (26.6^\circ)$

17. Find the value of x.

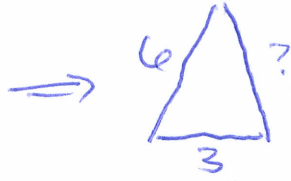
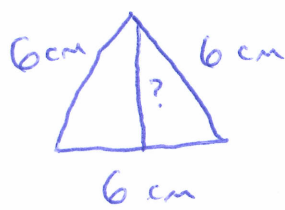
$\cos 65 = \frac{10}{x}$   
 $x = \frac{10}{\cos 65}$   
 $x = 23.66$



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18. One side of an equilateral triangle measures 6 cm. Find the exact measure of an altitude of the triangle.



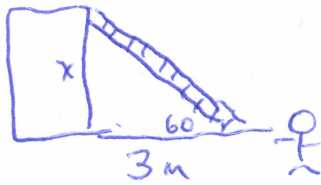
$$6^2 - 3^2 = \square^2$$

$$36 - 9 = \square^2$$

$$27 = \square^2$$

$$5.2 \text{ cm} = \square$$

19. A ladder leaning against a wall makes a  $60^\circ$  angle with the ground. The base of the ladder is 3 m from the building. How high above the ground is the top of the ladder?

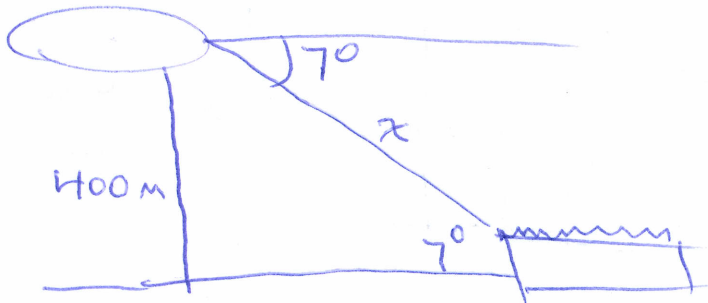


$$\tan 60 = \frac{x}{3}$$

$$3(\tan 60) = x$$

$$5.2 \text{ m} = x$$

20. A blimp is providing aerial television views of a football game. The television camera sights the stadium at a  $7^\circ$  angle of depression. The blimp's altitude is 400 m. What is the line-of-sight distance from the TV camera to the stadium, to the nearest hundredth meters?

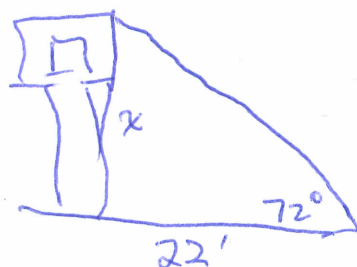


$$\sin 7^\circ = \frac{400}{x}$$

$$x = \frac{400}{\sin 7}$$

$$x = 3282.20 \text{ m}$$

21. At 2 P.M. the shadow of a lighthouse is 22 feet long and the angle of elevation is  $72^\circ$ . Find the height of the lighthouse.



$$\tan 72 = \frac{x}{22}$$

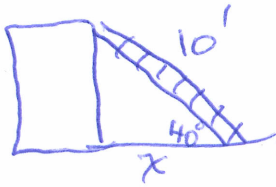
$$22(\tan 72) = x$$

$$67.7' = x$$

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22. A 10-ft ladder is placed against a wall forming a  $40^\circ$  angle with the ground. Determine the distance from the ladder to the wall.



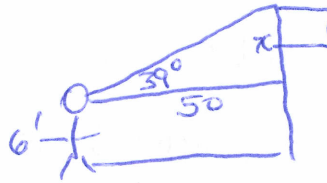
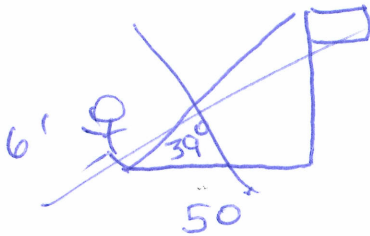
$$\cos 40 = \frac{x}{10}$$

$$10(\cos 40) = x$$

$$7.66' = x$$

4.4

23. A 6-foot tall man is standing 50 feet from a flagpole. When he looks at the top of the flagpole, the angle of elevation is  $39^\circ$ . Find the height of the flagpole to the nearest foot.



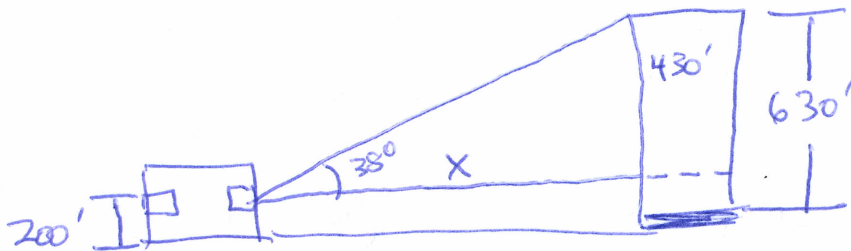
$$\tan 39 = \frac{x}{50}$$

$$50(\tan 39) = x$$

$$40.49 = x$$

$$40.49 + 6 = 46.49 \text{ ft}$$

24. James lives in an apartment building near a construction site and can see a skyscraper from his living window. He'd like to know how far his apartment building is from the skyscraper. He uses a clinometer to measure the angle of elevation from his apartment to the top of the skyscraper to be  $38^\circ$ . He knows that the skyscraper is 630 ft tall and the height of his living room window is 200 ft. Determine the horizontal distance between James' apartment and the skyscraper.

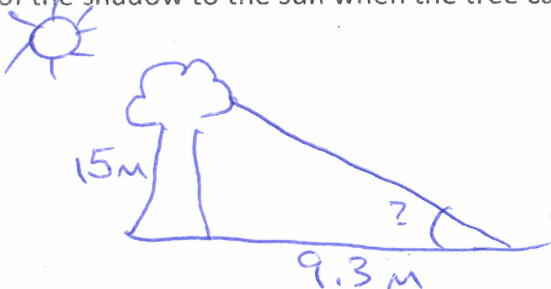


$$\tan 38 = \frac{430}{x}$$

$$x = \frac{430}{\tan 38}$$

$$x = 550.37 \text{ ft}$$

25. The height of a tree is 15 meters. To the nearest whole degree, what is the angle of elevation from the end of the shadow to the sun when the tree casts a shadow that is 9.3 meters long on level ground?



$$2^{\text{nd}} \tan^{-1} \left( \frac{15}{9.3} \right) = x$$

$$58.2^\circ = x$$