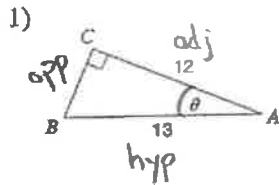


Right Triangle Trig. - Finding Missing Sides and Angles Date _____ Period _____

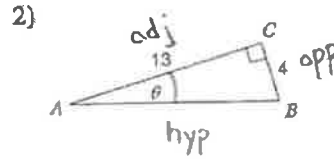
Find the measure of each angle indicated. Round to the nearest tenth.



$$\cos \theta = \frac{12}{13}$$

$$\theta = \cos^{-1}\left(\frac{12}{13}\right)$$

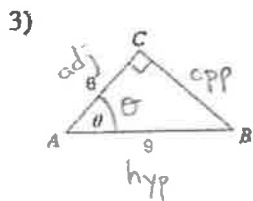
$$\theta = 22.6^\circ$$



$$\tan \theta = \frac{4}{13}$$

$$\theta = \tan^{-1}\left(\frac{4}{13}\right)$$

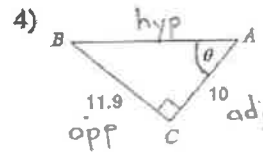
$$\theta = 17.1^\circ$$



$$\cos \theta = \frac{9}{14}$$

$$\theta = \cos^{-1}\left(\frac{9}{14}\right)$$

$$\theta = 48.2^\circ$$

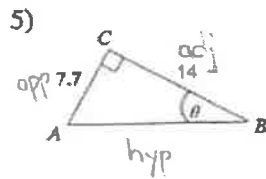


$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{11.9}{10}$$

$$\theta = \tan^{-1}\left(\frac{11.9}{10}\right)$$

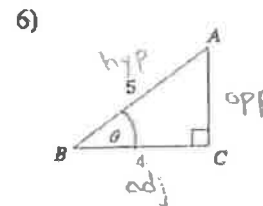
$$\theta = 50^\circ$$



$$\tan \theta = \frac{7.7}{14}$$

$$\theta = \tan^{-1}\left(\frac{7.7}{14}\right)$$

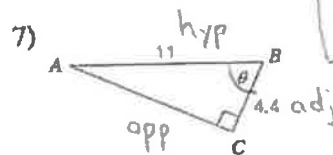
$$\theta = 28.8^\circ$$



$$\cos \theta = \frac{4}{5}$$

$$\theta = \cos^{-1}\left(\frac{4}{5}\right)$$

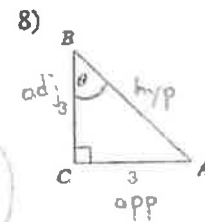
$$\theta = 36.9^\circ$$



$$\cos \theta = \frac{4.4}{11}$$

$$\theta = \cos^{-1}\left(\frac{4.4}{11}\right)$$

$$\theta = 66.4^\circ$$

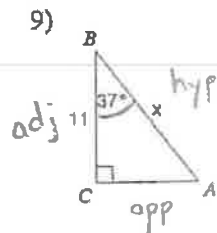


$$\tan \theta = \frac{3}{3}$$

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

$$\theta = 45^\circ$$

Find the measure of each side indicated. Round to the nearest tenth.

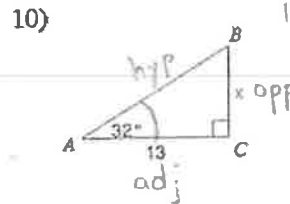


$$\cos \theta = \frac{11}{x}$$

$$\frac{x \cos \theta}{\cos \theta} = \frac{11}{\cos \theta}$$

$$x = \frac{11}{\cos 37}$$

$$x = 13.8$$

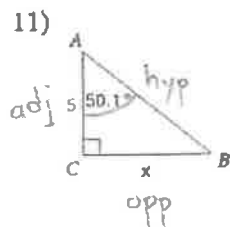


$$13 \cdot \cos \theta = \frac{x}{\cos \theta}$$

$$x = 13 \cos \theta$$

$$x = 13 \cos 32$$

$$x = 10.8$$

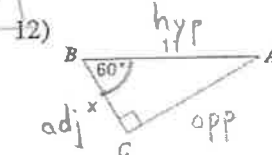


$$5 \cdot \tan \theta = \frac{x}{5}$$

$$x = 5 \tan \theta$$

$$x = 5 \tan 50.1$$

$$x = 5.98$$



$$11 \cos \theta = \frac{x}{\cos \theta}$$

$$x = 11 \cos \theta$$

$$x = 11 \cos 60$$

$$x = 5.5$$

13) $x \cdot \tan \theta = \frac{4}{x}$
 $x \frac{\tan \theta}{\tan \theta} = \frac{4}{\tan \theta}$

14) $x \sin \theta = \frac{10.8}{x}$
 $x = \frac{10.8}{\sin \theta}$
 $x = \frac{10.8}{\sin 57}$
 $x = 12.9$

15) $x = \frac{4}{\tan 41}$ $x = 4.6$
 $10.3 \sin \theta = \frac{x}{10.3}$
 $x = 10.3 \sin 37$
 $x = 6.2$

16) $3 \cos \theta = \frac{x}{3}$
 $x = 3 \cos(47)$
 $x = 2.05$

Solve each triangle. Round answers to the nearest tenth.

17) hyp 25.6 mi
 62° 28°
 22.6 mi
 12.0 mi

18) 7.3 in
 51°
 11.6 in
 9 in

19) 4.5 mi
 48°
 6.7 mi
 5.0 mi
 42°

20) 4 m
 3 m
 5 m
 37° 53°

21) 15.6 m
 29.3 m
 33.2 m
 62° 28°

22) 14 mi
 5.7 m
 12.8 mi
 24° 66°

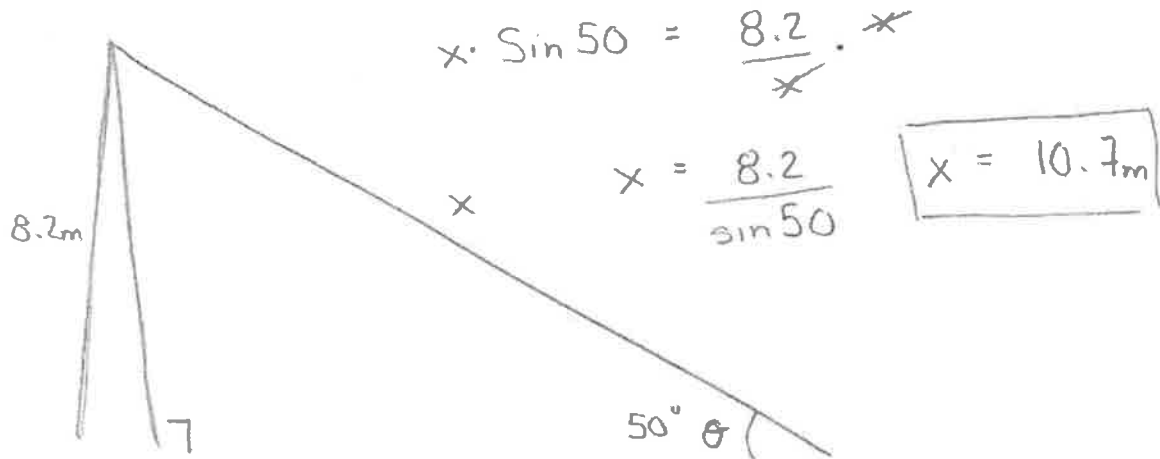
23) 1.9 cm
 3 cm
 2.3 cm
 50° 40°

24) 6.8 in
 3.2 in
 6 in
 62° 28°

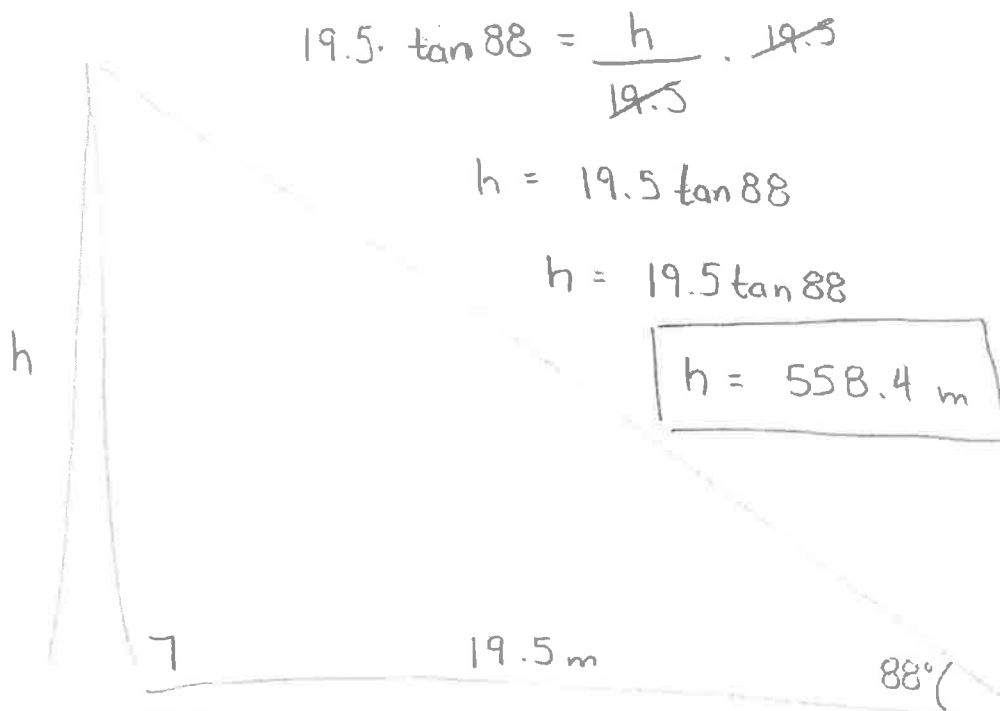
Section Assignment 1.3 Part 2
Solving Right Triangle Problems

Answer the following questions to the nearest tenth.

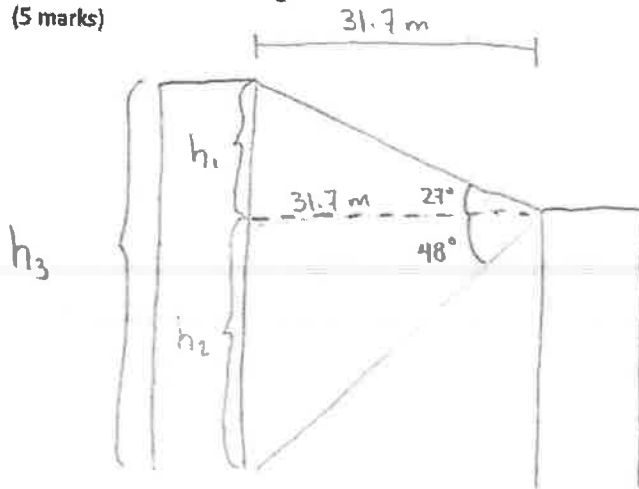
1. A guy wire must be attached to telephone pole 8.2 meters above the ground and should make an angle of 50° with the ground. How long should the wire be? (2 marks)



2. From the top of the CN Tower, the angle of depression to the tip of the tower's shadow is 88° . The shadow is 19.5 m long. How tall is the CN Tower? (2 marks)



3. Two buildings are 31.7 m apart. From the 12th floor of the shorter building, the angle of elevation to the top of the taller building is 27° . The angle of depression to the base of the taller building is 48° . What is the height of the taller building? (5 marks)



$$31.7 \cdot \tan 27 = \frac{h_1}{31.7} \cdot 31.7$$

$$h_1 = 31.7 \tan 27$$

$$h_1 = 16.2 \text{ m}$$

$$31.7 \tan 48 = \frac{h_2}{31.7} \cdot 31.7$$

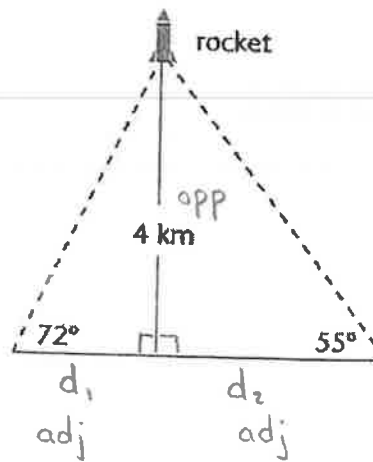
$$h_2 = 31.7 \tan 48$$

$$h_2 = 35.2 \text{ m}$$

$$h_3 = h_1 + h_2$$

$$h_3 = 51.4 \text{ m}$$

4. Two tracking stations, A and B, measure the height of a rocket to be 4 km. The angles of elevation of the rocket are found to be 72° and 55° . How far apart are the stations A and B? (5 marks)



$$d_1 \cdot \tan 72 = \frac{4}{d_1} \cdot d_1$$

$$d_1 \frac{\tan 72}{\tan 72} = \frac{4}{\tan 72}$$

$$d_1 = 1.3 \text{ km}$$

$$d_2 \tan 55 = \frac{4}{d_2} \cdot d_2$$

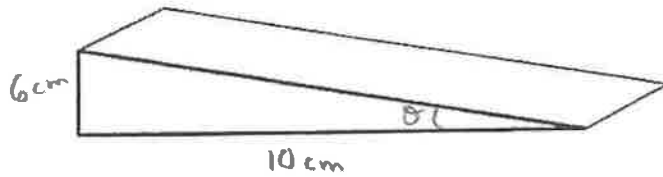
$$d_2 \frac{\tan 55}{\tan 55} = \frac{4}{\tan 55}$$

$$d_2 = 2.8 \text{ km}$$

$$d_3 = d_1 + d_2 = 1.3 \text{ km} + 2.8 \text{ km}$$

$$d_3 = 4.1 \text{ km}$$

3. Jen is helping to build a wheelchair ramp that will have a 6% grade (i.e., a rise of 6 cm for a horizontal change of 100 cm). Which of the following expressions will calculate the angle between the ground and the top part of the ramp?



a. $\cos = \left(\frac{6}{100}\right)$

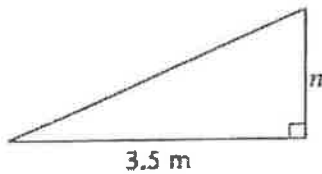
b. $\tan^{-1} = \left(\frac{6}{100}\right)$

c. $\cos^{-1} = \left(\frac{6}{100}\right)$

d. $\tan = \left(\frac{6}{100}\right)$

You may use your calculator for the last six questions.

4. Using a protractor, measure one of the unknown angles and determine the unknown length n .



a. 8.4 m

b. 1.5 m

c. 1.3 m

d. 3.2 m

5. In $\triangle DEF$; $\angle D = 90^\circ$, $DE = 5$ m, and $EF = 13$ m. Calculate the measure of $\angle EFD$.

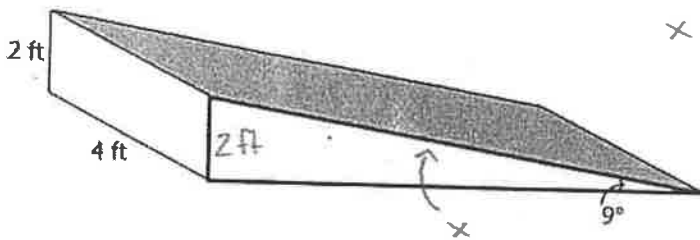
a. 69°

b. 21°

c. 67°

d. 23°

6. Katie is making plans to build a skateboard ramp, and she needs to know how much wood to buy. Using the diagram below, calculate the area of the top part of the ramp.



$$x \sin 9 = \frac{2}{x}$$

$$x = \frac{2}{\sin 9}$$

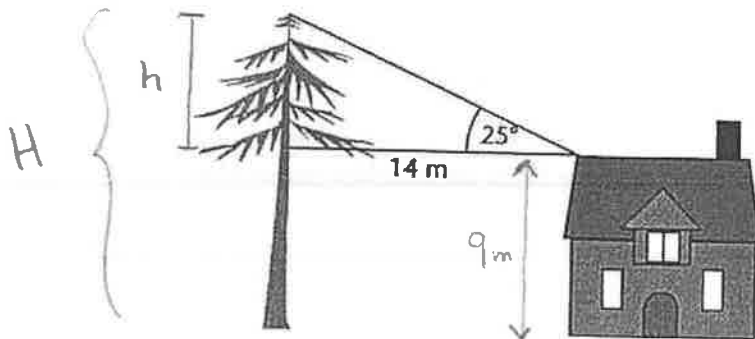
$$x = 12.8 \text{ ft}$$

- a. 25.6 square feet
- b. 102.3 square feet
- c. 50.5 square feet
- d. 51.1 square feet

$$A = 4 \text{ ft} \times 12.8 \text{ ft}$$

$$A = 51.1$$

7. A 9 metre tall house is located 14 m away from a tree. The angle of elevation from the roof of the house to the tree is 25° . If the tree falls directly toward the house, which of the following will occur?



$$14 \cdot \tan 25 = \frac{h}{14}$$

$$h = 14 \tan 25$$

$$h = 6.5 \text{ m}$$

$$H = 9 \text{ m} + 6.5 \text{ m}$$

$$H = 15.5 \text{ m}$$

- a. The top of the tree will just touch the side of the house.
- b. The tree will not hit the side of the house.
- c. The tree will hit the side of the house.
- d. There is not enough information to tell what will happen.

$$15.5 \text{ m} > 14 \text{ m}$$

Will Hit