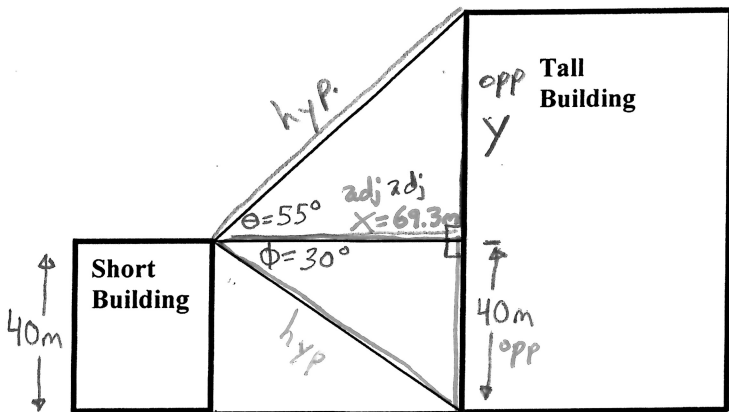


Additional Practice Solving Sides
Using Basic Trigonometry
SOH CAH TOA

1. Two buildings stand side by side. The short building is 40 m high. From the top of the short building, the angle of elevation to the top of the tall building is 55° . From the top of the short building, the angle of depression to the bottom of the tall building is 30° . What is the height of the tall building?

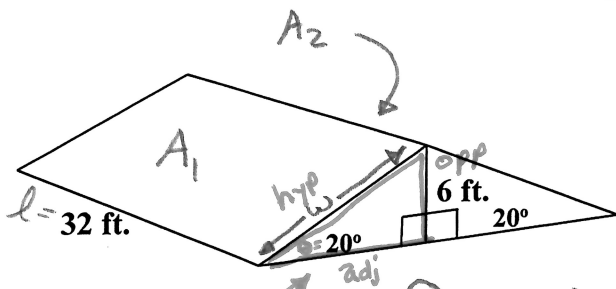


① $\tan \phi = \frac{\text{opp.}}{\text{adj.}}$
 $\frac{\tan(30^\circ) = \frac{40}{x}}{1 \quad x}$
 $\frac{x \tan(30^\circ) = 40}{\tan(30^\circ)}$
 $x = 69.3\text{m}$

② $\tan \theta = \frac{\text{opp}}{\text{adj}}$
 $\frac{\tan(55^\circ) = \frac{Y}{69.3}}{1 \quad 69.3}$
 $Y = 69.3 \tan(55^\circ)$
 $Y \approx 99\text{m}$

③ Height = $40 + Y$
 $= 40 + 99$
 $= 139\text{m}$

2. Roofing tiles cost \$7.25 per square foot. How much will it cost to cover the roof described in the diagram below?



① $\sin \theta = \frac{\text{opp}}{\text{hyp}}$
 $\frac{\sin(20^\circ) = \frac{6}{w}}{1 \quad w}$
 $\frac{w \sin(20^\circ) = 6}{\sin(20^\circ)}$
 $w \approx 17.5 \text{ feet}$

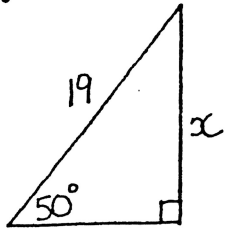
② $A_1 = lw$
 $= (32)(17.5)$
 $= 560 \text{ sqft. (ft}^2\text{)}$

③ $A_{\text{Total}} = A_1 + A_2$
 $= A_1 + A_1$
 $= 2A_1$
 $= 2(560)$
 $= 1120 \text{ sqft}$

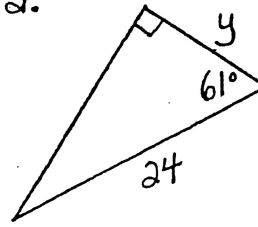
④ Cost = $(1120 \text{ sqft})(\$7.25/\text{sqft})$
 $= \$8120$

Use TRIG RATIOS to find the indicated sides. (One decimal accuracy)

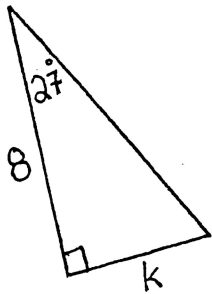
1.



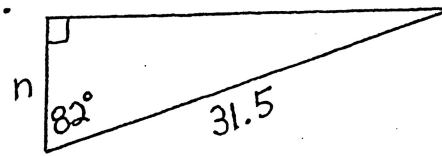
2.



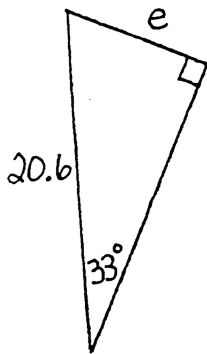
3.



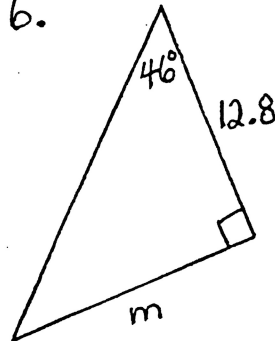
4.



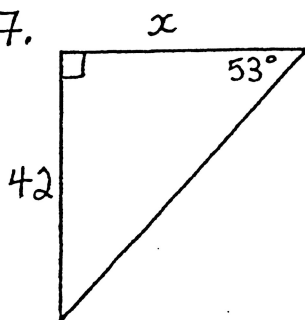
5.



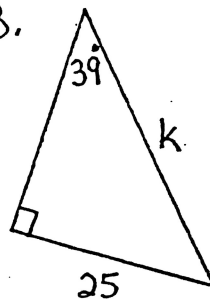
6.



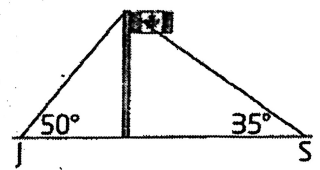
7.



8.

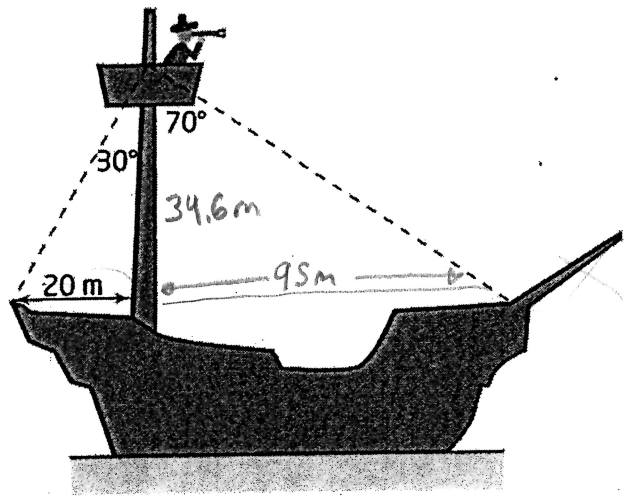


9. Jack and Sangita are facing each other on opposite sides of a 10-m flagpole. From Jack's point of view, the top of the flagpole is at an angle of elevation of 50° . From Sangita's it is 35° .



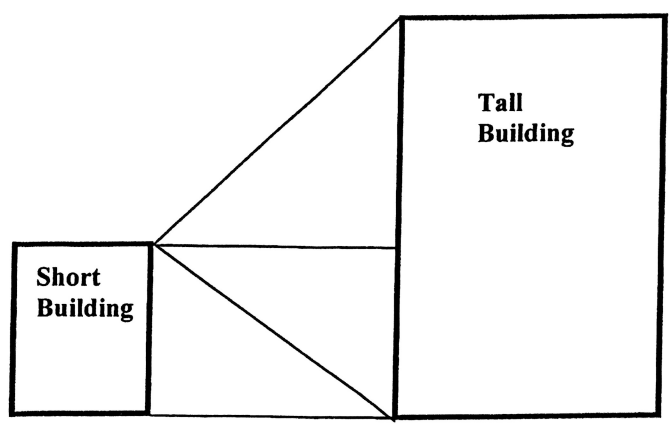
How far apart are Jack and Sangita?

10. Captain Jack is sitting in the crow's-nest of his ship, as shown.



- a) How high above the deck is Captain Jack?
- b) What is the length of Captain Jack's ship?
- c) How long is each wire holding up the crow's-nest?

11. Two buildings stand side by side. The short building is 30 m high. From the top of the short building, the angle of elevation to the top of the tall building is 40° . From the top of the short building, the angle of depression to the bottom of the tall building is 20° . What is the height of the tall building?



Answers:

- 1. 14.6 2. 11.6
- 3. 4.1 4. 4.4
- 5. 11.2 6. 13.3
- 7. 31.6 8. 39.7
- 9. 22.3 m 10. a) 34.6 m
- b) 115.2 m c) 40 m, 101 m
- 11. 99.2 m