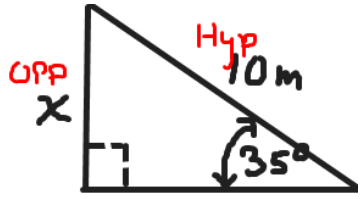
GRADE 12 ESSENTIAL
UNIT G TRIGONOMETRY
SOLVING RIGHT ANGLE TRIANGLES

Name: _____
Date: _____

Show work! Lots of space provided. Do the puzzle(s); that lets you know you have correct answers! Follow the model steps you have been shown!!! Do not invent your own way!!! The figures are mostly to scale in these shapes, so somewhat easy to 'eyeball' an approximate answer.

Steps:

- **Label sides: Hypotenuse, Opposite to angle, Adjacent to angle**
  - Hypotenuse is always across from the right angle.
- **Select 'trigonometric ratio' formula from SO/H CA/H TO/A**
- **Use proportions to solve for the unknown**
- **Use Trigonometric tables or calculator**
  - Make sure calculator is in degree mode!

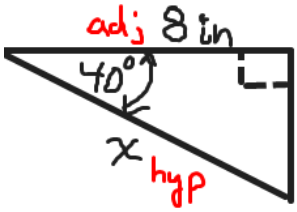


$\sin(35) = \frac{OPP}{HYP}$

$\sin(35) = \frac{x}{10}$

$x = 10 \sin 35^\circ$

$x = 5.7\text{ m}$

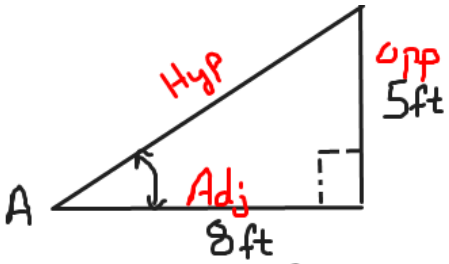


$\cos(40^\circ) = \frac{Adj}{Hyp}$

$\cos 40^\circ = \frac{8}{x}$

$x = \frac{8}{\cos 40}$

$x = 10.4\text{ in}$

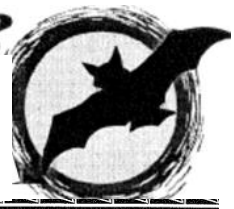


$\tan(\angle A) = \frac{OPP}{Adj}$

$\tan(\angle A) = \frac{5}{8} = 0.625$

$\angle A = \tan^{-1}(5/8) = 32^\circ$

Who Turns Out the Lights on Halloween?



Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces below them to solve the riddle

SO	TH	AC	AT	EB	EL	ME	AB	IG	ET	OO
42.5 m	22.5 ft	20.6 m	5.0 cm	130.5 ft	128.1 ft	92.51	19.0 ft	4.7 cm	16.1 mi	298.57
HT	**OP**	**SW**	**AY**	**IN**	**QU**	**IT**	**UP**	**MU**	**CH**	**OK**
55.4 in.	9.42	20.3 mi	24.4 mi	5.62	37.8 ft	38.1 m	17.1 ft	52.0 in.	95.32	5.7 in.

In Exercises 1 – 4, solve the equation. Round your solution to two decimal places.

1. $\sin 22° = \frac{x}{15}$

2. $\tan 75° = \frac{n}{80}$

3. $\sin 48° = \frac{7}{a}$

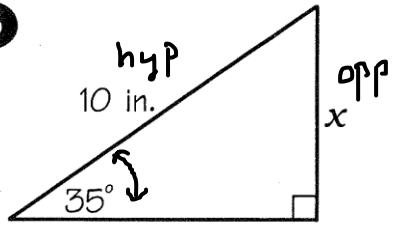
$a = 7/\sin 48$

$a = 9.42$

4. $\cos 6° = \frac{92}{k}$

In exercises 5 -12, find the length of the side labeled x. Round to one decimal place.

5.

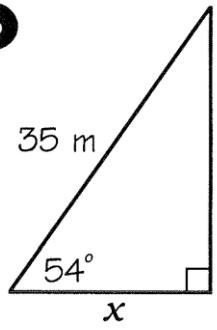


$\sin 35° = \frac{x}{10}$

$x = 10 \cdot \sin 35°$

$x = 5.7$ in

6.



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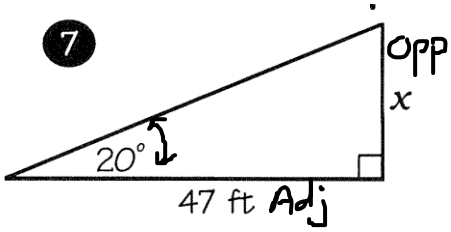
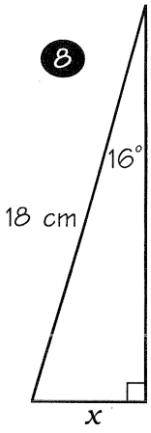


$\tan 20° = \frac{x}{47}$

8



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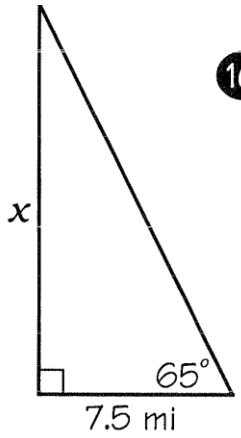

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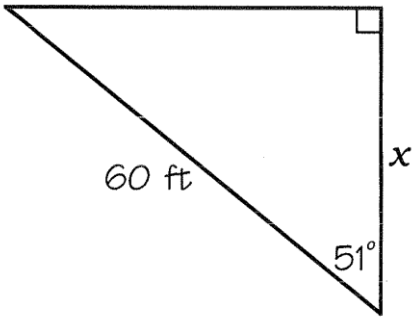

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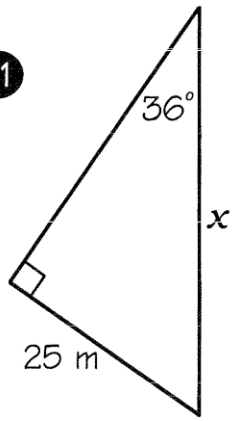

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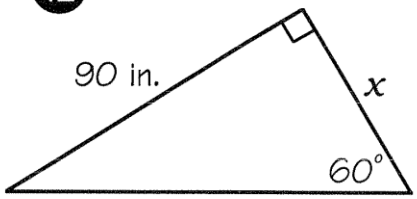
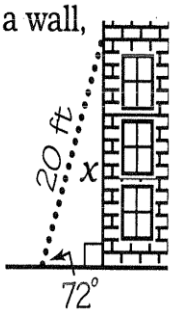
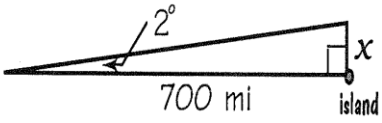


In Exercises 13-15, find the required length. Round to one decimal place.

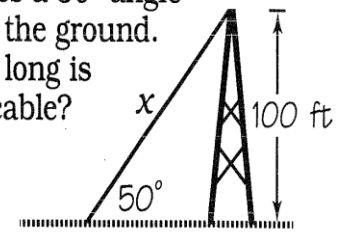
13 When a 20-ft ladder is leaned against a wall, it makes a 72° angle with the ground. How high up on the wall does the ladder reach?



14 A ship is sailing toward a small island 700 mi away. If the ship is 2° off course, by how many miles will it miss the island?



15 A cable from the top of a 100-ft telephone tower makes a 50° angle with the ground. How long is the cable?



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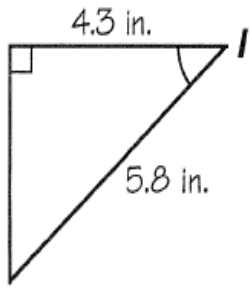
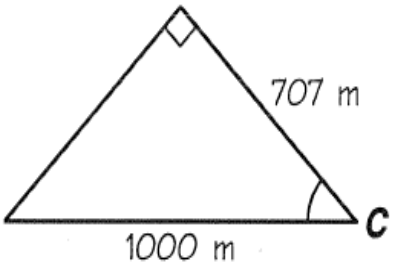
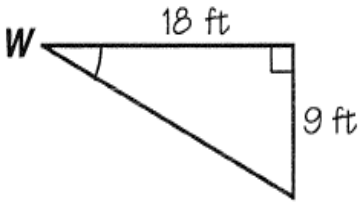
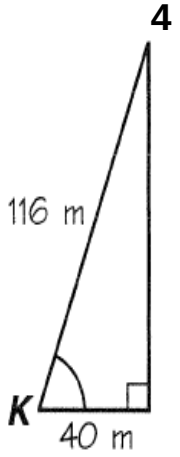
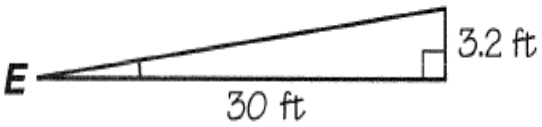




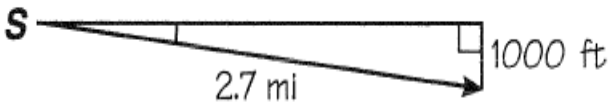




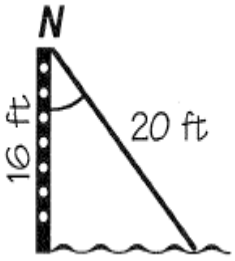
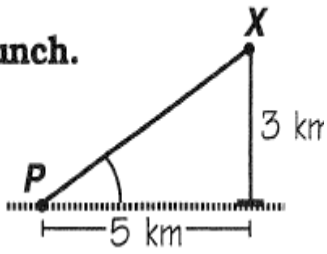
An access ramp rises 3.2 ft over a distance of 30 ft. What is the angle of the ramp with the horizontal?



A plane descends 1000 ft while flying 2.7 mi. What is the angle of descent? (1 mi = 5280 ft)



The top of a 20-ft waterslide is 16 ft above the ground. What angle does the slide make with the vertical ladder?



Tracking a Rocket Launch. At what angle must a camera at point *P* be aimed to photograph a rocket at point *X*?