

LESSON
13-1

Tangent Ratio

Practice and Problem Solving: A/B

Use a calculator to find each tangent or inverse tangent. Round tangents to the nearest tenth and angles to the nearest degree.

2. $\tan 23^\circ \approx$ _____

3. $\tan 43^\circ \approx$ _____

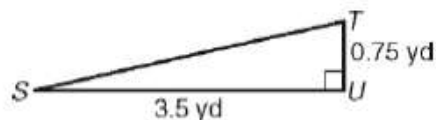
4. $\tan 47^\circ \approx$ _____

5. $\tan^{-1} 0.14 \approx$ _____ $^\circ$

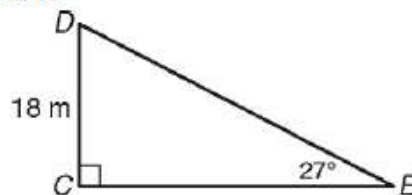
6. $\tan^{-1} 1 =$ _____ $^\circ$

7. $\tan^{-1} 6.1 \approx$ _____ $^\circ$

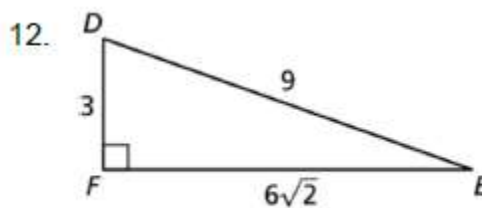
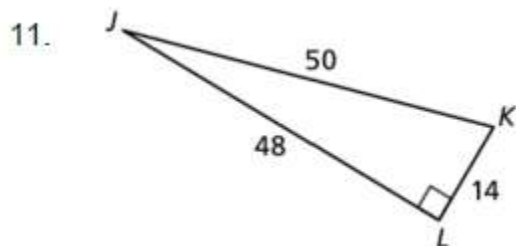
9. Write a ratio that gives $\tan S$. _____ Use the inverse tangent on your calculator to find $m\angle S$.



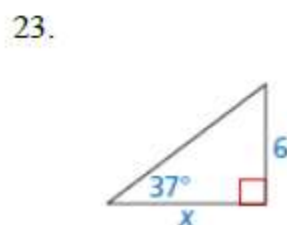
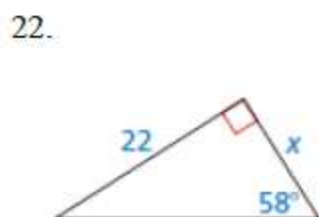
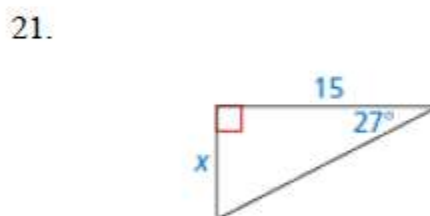
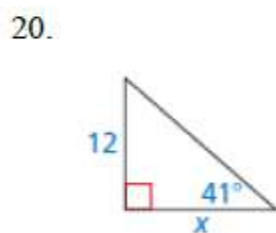
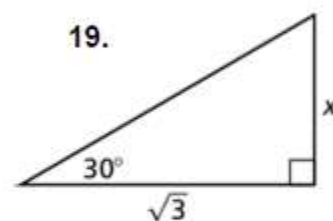
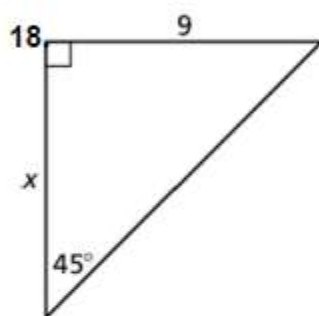
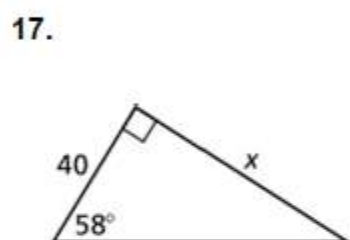
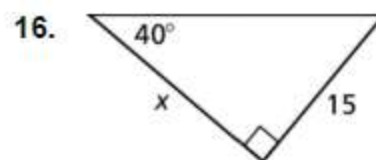
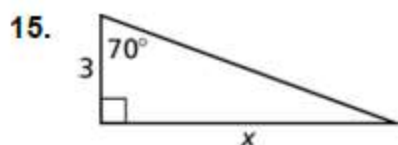
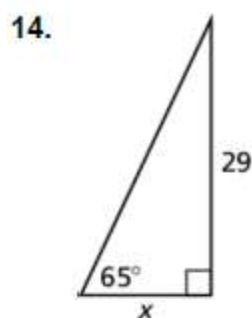
10. Write and solve a tangent equation to find the length of CE. Round to the nearest 0.1 meter.



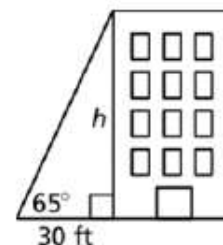
In Exercises 11 and 12, find the value of $\tan (J)$, $\tan (K)$, $\tan (D)$, and $\tan (E)$. Write each answer as a fraction.



In Exercises 14 - 23, find the value of x . Round your answer to the nearest tenth.

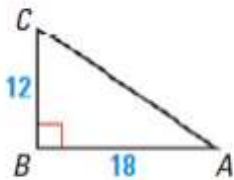


24. A surveyor is standing 30 feet from the base of a tall building. The surveyor measures the angle of elevation from the ground to the top of the building to be 65° . Find the height h of the building to the nearest foot.

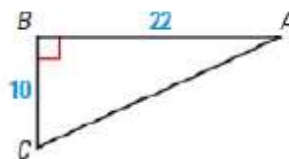


Consider the right triangles. Use a calculator to find the measure of $\angle A$ to the nearest degree.

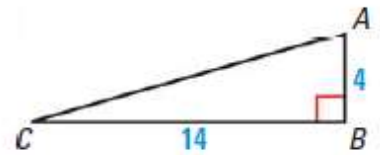
32.



33.



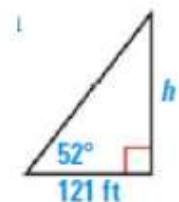
34.



43. A surveyor is standing 118 feet from the base of the Washington Monument. The surveyor measures the angle of elevation from the ground and the top of the monument to be 78° . Draw a picture of the situation and then find the height of the Washington Monument to the nearest foot.

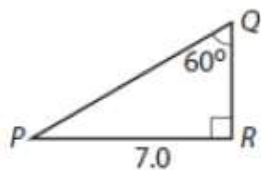


44. A roller coaster makes an angle of elevation of 52° with the ground. The horizontal distance from the crest of the hill to the bottom of the hill is about 121 feet, as shown. Find the height h of the roller coaster to the nearest foot.

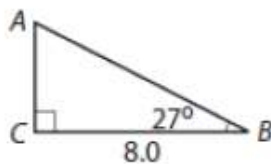


Use the tangent to find the unknown side length.

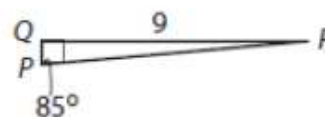
9. Find QR.



10. Find AC.

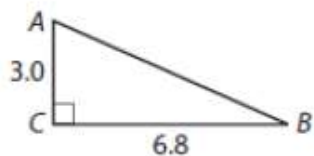


11. Find PQ.

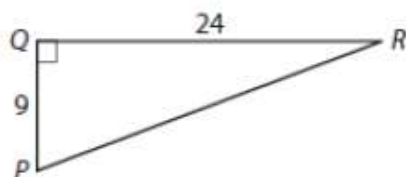


Find the measure of the angle specified for each triangle. Use the inverse tangent (\tan^{-1}) function of your calculator. Round your answer to the nearest degree.

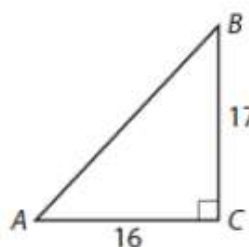
15. Find $\angle A$.



16. Find $\angle R$.

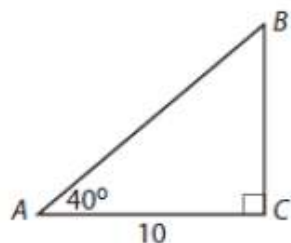


17. Find $\angle B$.

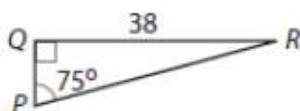


Write an equation using either \tan or \tan^{-1} to express the measure of the angle or side. Then solve the equation.

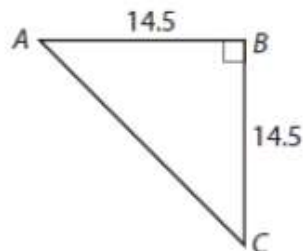
18. Find BC .



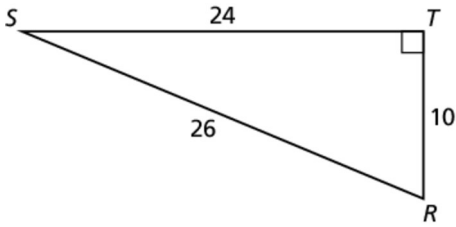
19. Find PQ .



20. Find $\angle A$ and $\angle C$.



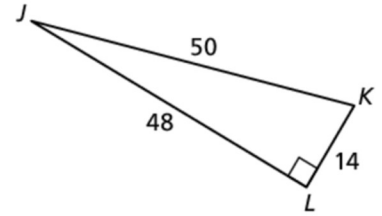
21. Consider this right triangle. Determine whether each equation is correct. Mark YES or No for each equation.



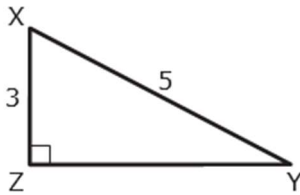
Equation	Yes	No
$\tan(R) = \frac{24}{10}$		
$\tan(S) = \frac{26}{24}$		
$\tan(R) = \frac{10}{24}$		
$\tan(S) = \frac{10}{24}$		

22. Consider this right triangle. Find the value of $\tan(K)$.

- A. $\frac{14}{50}$
- B. $\frac{48}{14}$
- C. $\frac{50}{48}$
- D. $\frac{48}{50}$



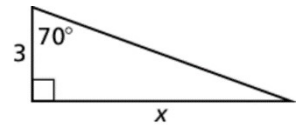
23. Consider this right triangle



Decide whether each expression can be used to find the length of \overline{ZY} . Mark Yes or No for each expression.

expression	Yes	No
$3 \tan(X)$		
$3 \tan(Y)$		

24. Consider this right triangle



Decide whether each expression can be used to find the length of x . Mark Yes or No for each expression.

expression	Yes	No
$\frac{3}{\tan(70^\circ)}$		
$3 \tan(70^\circ)$		