Simplify each of the following.
1. \( \sqrt{60} \) 
2. \( \sqrt{5} \times \sqrt{15} \) 
3. \( \frac{9}{\sqrt{3}} \) 
4. \( \frac{5\sqrt{2}}{\sqrt{2}} \)

Determine the length of the missing side by using the Pythagorean Theorem. Simplify your answers.
5. 
\[
\begin{array}{c}
\text{10} \\
\text{x} \\
\text{6}
\end{array}
\]
6. 
\[
\begin{array}{c}
\text{13} \\
\text{x} \\
\text{5}
\end{array}
\]
7. 
\[
\begin{array}{c}
\text{x} \\
\text{8}
\end{array}
\]

Determine the length of the missing values by using the properties of special right triangles. Show all your work and simplify your answers.
8. 
\[
\begin{array}{c}
\text{x} \\
\text{3\sqrt{2}} \\
\text{45°}
\end{array}
\]
9. 
\[
\begin{array}{c}
\text{y} \\
\text{x} \\
\text{45°}
\end{array}
\]
10. 
\[
\begin{array}{c}
\text{x} \\
\text{\sqrt{6}} \\
\text{60°}
\end{array}
\]
11. 
\[
\begin{array}{c}
\text{y} \\
\text{x} \\
\text{30°}
\end{array}
\]

12. Draw and label a diagram that represents following functions. Do not solve any of them.
   a.) \( \sin 56° = \frac{12}{x} \) 
   b.) \( \cos 49° = \frac{y}{7} \) 
   c.) \( \tan 37° = \frac{x}{y} \)

Solve for the values of \( x \) and \( y \) by using trigonometric functions. Simplify your answers.
13. 
\[
\begin{array}{c}
\text{x} \\
\text{y} \\
\text{52°}
\end{array}
\]
14. 
\[
\begin{array}{c}
\text{x} \\
\text{y} \\
\text{46°}
\end{array}
\]
15. 
\[
\begin{array}{c}
\text{x} \\
\text{y} \\
\text{30°}
\end{array}
\]
Draw and label a right triangle diagram then solve for the desired measurement.

16. When the sun’s angle of elevation is $57^\circ$, a building casts a shadow 21 m long. How high is the building?

17. The angle of depression from a balloon on a 75-foot string to a person on the ground is $36^\circ$. How high is the balloon?

18. Jeremy has a skate board ramp set $30^\circ$ from the ground. If the height of the platform is 8 feet from the ground, how long is the ramp up to the top of the platform?

19. Two joggers run 8 miles north and then run 5 miles west. What is the shortest distance they must run to return to their starting point?

Solve for the missing measurement(s). You may use a method of your choice but must show your work.

20.

21.

22.

23.

24.

25.