Vocabulary: Define each word or concept and give an example.

1. Pythagorean triple

2. Special right triangle(s)

3. Trig ratio

Short Answer:

4. Explain how a right triangle could have lengths of sides $5, 7, \sqrt{74}$

5. Describe how to classify a triangle as acute, obtuse, or right with side lengths of 6, 9, 10.

6. Explain why the sine or cosine ratio can’t be used to find missing information if the hypotenuse is not known?

Review:

7. Write the definition of similar triangles.

8. Given, $\triangle ABC \sim \triangle DEF$ name the six corresponding parts and their relationships.

$\angle A \cong \angle D$  \hspace{2cm} \hspace{2cm} \hspace{2cm}

\hspace{2cm} \hspace{2cm} \hspace{2cm}
9. Solve the following proportion: \( \frac{9}{x} = \frac{x}{4} \)

10. The measures of two consecutive angles of a parallelogram are in the ratio of 6:13. Find the measure of each of the two consecutive angles.

\[108^\circ\quad 288^\circ\]

**Problems:**

**Be sure to show all work used to obtain your answer. Circle answers where appropriate**

11. Decide whether the numbers 3, 4, and 6 can represent the side lengths of a triangle. If they can, classify the triangle as right, acute, or obtuse.

12. Find the lengths of \( \overline{CD} \) and \( \overline{AB} \)
   
   a. \( \overline{CD} = \) 
   
   b. \( \overline{AB} = \)

13. The perimeter of a square is 40 inches. Find the length of the diagonal.

14. Write the sine ratio, the cosine ratio, and the tangent ratio of \( \angle A \).

\[
\frac{20}{25} = \frac{15}{20} = \frac{25}{20}
\]

15. You know the height of a lighthouse and the angle of depression to a buoy as shown in the diagram. How far is the buoy from the lighthouse \( (x) \)? Write your answer in simplest radical form, if needed.

\[
x = \sqrt{22^2 - 20^2}
\]

22 m
16. \( \overline{CN} \) is an altitude to the hypotenuse of a right triangle. Complete the proportion.

\[
\frac{AN}{AC} = \frac{AC}{?}
\]

17. Use the diagram at the right to find the expression that could be used to calculate \( AC \).

A. \( 20 \cos 25^\circ \)
B. \( 20 \sin 25^\circ \)
C. \( \frac{20}{\cos 25^\circ} \)
D. \( \frac{20}{\sin 25^\circ} \)

18. Use the dimensions given in the right triangle below.

What is the tangent of \( \angle A \)?

A. \( \frac{3}{5} \)
B. \( \frac{2}{3} \)
C. \( \frac{9}{10} \)
D. \( \frac{10}{9} \)

19. Mort measures the length of the shadow of a tree to be 30 feet long. At the same time his shadow measures 10 feet long and his height is 6 feet. How tall is the tree?

A. 18 ft
B. 30 ft
C. 36 ft
D. 60 ft

20. Given the two triangles pictured below, what measure for \( \angle N \) would make \( \triangle HIJ \sim \triangle NOP \)?

A. 28°
B. 48°
C. 52°
D. 62°
21. Use the dimensions given in the diagram below.

What is the length of the diagonal from \( A \) to \( B \)?

A. \( 4\sqrt{10} \) cm
B. \( \sqrt{141} \) cm
C. \( 5\sqrt{5} \) cm
D. 13 cm

22. Use the dimensions given in the diagram below.

What is the value of \( y \)?

A. \( 7\sqrt{2} \)
B. \( 7\sqrt{3} \)
C. \( 14\sqrt{2} \)
D. 14

23. Use the table and the dimensions given in the diagram below.

<table>
<thead>
<tr>
<th>( \theta )</th>
<th>( \sin \theta )</th>
<th>( \cos \theta )</th>
<th>( \tan \theta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°</td>
<td>.3420</td>
<td>.9397</td>
<td>.3640</td>
</tr>
<tr>
<td>30°</td>
<td>.5000</td>
<td>.8660</td>
<td>.5774</td>
</tr>
<tr>
<td>40°</td>
<td>.6428</td>
<td>.7660</td>
<td>.8391</td>
</tr>
<tr>
<td>50°</td>
<td>.7660</td>
<td>.6428</td>
<td>1.1918</td>
</tr>
</tbody>
</table>

What is the value of \( r \)?

A. 6.428
B. 7.660
C. 8.391
D. 11.918

NOTE:
Semester 2 Exam Questions 28, 30, 31, 32, 36-47, and Free Response Question 2 apply to this unit. Review them carefully.
24. Solve the right triangle.

25. Find the area of the triangle.

26. Use the dimensions given in the diagram below.
What is the approximate height $h$ of the kite off the ground in feet?

27. Use the dimensions given in the diagram below.
What is the airplane’s approximate angle of descent?