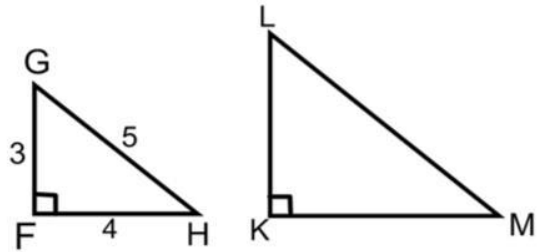1. What is the correct ratio for tan B?

   A. $\dfrac{b}{a}$ C. $\dfrac{a}{b}$
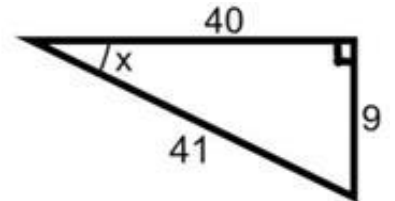
   B. $\dfrac{a}{c}$ D. $\dfrac{b}{c}$
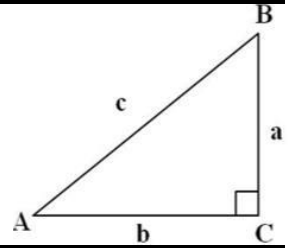
2. $\Delta FGH \sim \Delta KLM$ Which of the following must be **TRUE**?

   A. tan G = tan L

   B. tan G = tan M

   C. sin H = sin L

   D. sin H = tan M

3. What is the value of sin X?

   A. $\dfrac{9}{40}$ C. $\dfrac{40}{41}$

   B. $\dfrac{9}{41}$ D. $\dfrac{41}{9}$

4. Which of the statements are **TRUE**?

   I. You can solve a right triangle if you are given the lengths of any two sides.
   II. You can solve a right triangle if you are given the measures of two acute angles.
   III. You can solve a right triangle if you are given the length of 1 side & the measure of 1 acute angle.

   A. I only   B. II only   C. II and III   D. I and III

5. In right $\Delta HJK, \angle J = 90° \ and \ \tan H = 1$. Which statement about ΔHJK must be **TRUE**?

   A. $\sin H = \dfrac{1}{2}$ B. $\sin H = 1$ C. $\sin H = \cos H$ D. $\sin H = \dfrac{1}{\cos H}$

6. Which of the following is equal to $\cos 40°$

   A. $\sin 30°$ B. $\sin 40°$ C. $\sin 50°$ D. $\sin 60°$

7. In right $\Delta ABC, \angle A$ & $\angle B$ are complementary angles. If $\cos A = \dfrac{5}{13}$, what is the value for $\sin B$?

   A. $\dfrac{5}{13}$ B. $\dfrac{13}{5}$ C. $\dfrac{12}{13}$ D. $\dfrac{13}{12}$

8. In right $\Delta ABC, \angle A$ & $\angle B$ are the acute angles. If $\cos A = \dfrac{7}{25}$, what is $\cos B$?

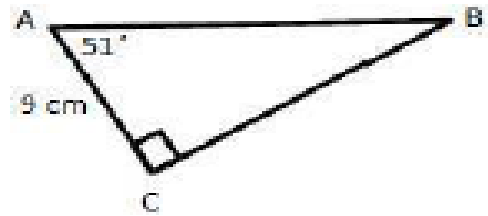   A. $\dfrac{7}{25}$ B. $\dfrac{24}{25}$ C. $\dfrac{7}{24}$ D. $\dfrac{25}{24}$
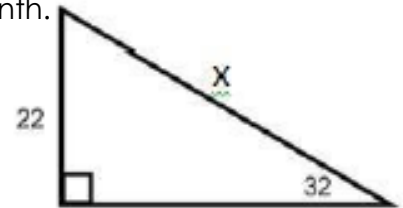
9. What is the perimeter of the right triangle? Round to the nearest tenth of a centimeter.

   A. 25.4cm

   B. 27.4cm

   C. 34.4cm

   D. 36.4cm

10. What is the length of the hypotenuse? Round to the nearest tenth.

   A. 11.7

   B. 25.9

   C. 35.2

   D. 41.5

11. Which of the following shows the correct way to solve for y.

   A. $y = 5\sin 28°$

   B. $y = 5\cos 28°$

   C. $y = \dfrac{5}{\cos 28°}$

   D. $y = \dfrac{5}{\sin 28°}$
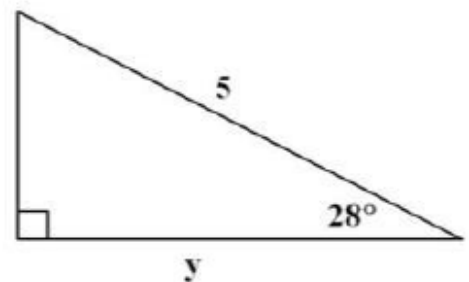
12. What is the length of the diagonal of the rectangle?
    Round to two decimal places.

   A. 7.61

   B. 16.31

   C. 19.86

   D. 38.60
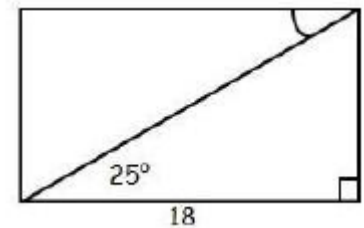
13. What is the missing angle in the triangle?

   A. 37°

   B. 39°

   C. 51°

   D. 53°
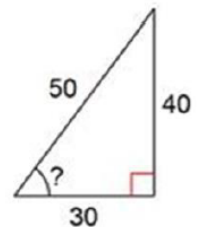
14. Shane is cutting a piece of tile as shown in the diagram.
    Which equation can be used to find x, the length of the
    longest side of the piece of tile?

   A. $x = 2\tan 63°$

   B. $x = 2\cos 63°$

   C. $x = \dfrac{2}{\sin 63°}$

   D. $x = \dfrac{2}{\cos 63°}$

15. The perimeter of an equilateral triangle is 36 meters. What is the height of the triangle?
    A. $6m$
    B. $12m$
    C. $6\sqrt{2}\,m$
    D. $6\sqrt{3}\,m$

16. What is the length of the diagonal of a square with side lengths $8\sqrt{2}\,cm$?
    A. $8\sqrt{2}\,cm$
    B. $4\sqrt{2}\,cm$
    C. $8cm$
    D. $16cm$

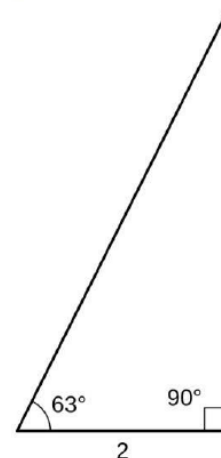17. A boat travels 300 meters (m) north from a dock in an ocean. Because of the current, the boat is also carried 50 meters west as shown. What is the distance, d, from the boat to the dock, rounded to the nearest meter?
    A. 250 m
    B. 296 m
    C. 304 m
    D. 350 m

18. A kite is flying 70 feet above the ground and is attached to a string tied to a stake on the ground. The angle of elevation formed by the string and the ground is 40°. What is the length of the string? Round to the nearest foot.
    A. 45 feet
    B. 83 feet
    C. 91 feet
    D. 109 feet

19. Ranger Chris spots a fire at an angle of depression of 20° from his 70 feet tall tower. How far is the fire from the base of the tower?
    A. 23.94 feet
    B. 25.48 feet
    C. 192.32 feet
    D. 204.67 feet

20. Thomas stands 65 yards from the base of a lighthouse. The height of the lighthouse is 75 yards. What is the angle of depression from the top of the lighthouse to Thomas?
    A. $29.9°$
    B. $49.09°$
    C. $60.1°$
    D. $35.1°$

21. The legs of a right triangle measure 11.4 meters and 15.1 meters. To the nearest tenth, what is the measure of the smallest angle in the triangle?
    A. $37.1°$
    B. $41°$
    C. $49°$
    D. $52.9°$

22. The angle of elevation to the top of a tree for a person whose eye level is 5 feet above the ground is 29°. The person is standing approximately 162 feet from the base of the tree. What is the height of the tree to the nearest foot? 37.1

    A. 79 feet
    B. 84 feet
    C. 90 feet
    D. 95 feet

23. A ramp leading to a building is 30 feet long and stands 6 feet high.
(NOTE: Your teacher will score your response to this question using a 4-point rubric.)

- **Part A** Draw a picture to illustrate the problem.

- **Part B** Find the angle of elevation of the ramp that was built.
Round answer to the nearest hundredth, if necessary.

- **Part C** The building code for the city states that angle of a ramp cannot exceed 10 degrees. Does the ramp meet code regulations? Explain why or why not.

_____

_____

_____

_____

- **Part D** If the ramp does NOT fit regulations, how can the builder change the ramp to make it comply with building code regulations? Be specific

_____

_____

_____

_____