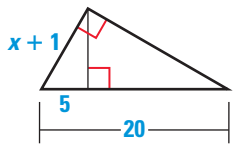
CHAPTER 9

Chapter Standardized Test

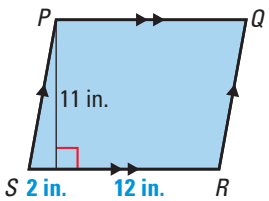
TEST-TAKING STRATEGY When checking your work, try to use a method other than the one you originally used to get your answer. If you use the same method, you may make the same mistake twice.

1. MULTIPLE CHOICE Use the diagram to find the value of x.



Ⓐ 6 Ⓑ 7 Ⓒ 9 Ⓓ 10 Ⓔ 11

In Questions 2 and 3, use the diagram below.



2. MULTIPLE CHOICE Find the area of $\square PQRS$.

Ⓐ 132 in.^{2} Ⓑ 143 in.^{2} Ⓒ 154 in.^{2} Ⓓ 156 in.^{2} Ⓔ 166 in.^{2}

3. MULTIPLE CHOICE Find the perimeter of $\square PQRS$ rounded to the nearest tenth.

Ⓐ 44.4 in. Ⓑ 46.4 in. Ⓒ 50 in. Ⓓ 50.4 in. Ⓔ 52.4 in.

4. MULTIPLE CHOICE Let the numbers represent the lengths of the sides of a triangle. Which of the triangles are right triangles?

I. 11, 14, $\sqrt{317}$ **II.** 7, 26, $5\sqrt{30}$

III. 18, $2\sqrt{19}$, 20 **IV.** 9, 25, 27

Ⓐ I, II, and III only Ⓑ I and III only Ⓒ III only Ⓓ IV only Ⓔ none

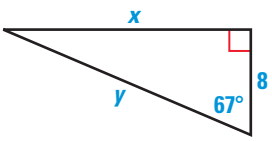
5. MULTIPLE CHOICE Which set of numbers can represent the side lengths of an obtuse triangle?

Ⓐ 71, 70, 68 Ⓑ 30, 40, 50 Ⓒ 41, 39, 2 Ⓓ 25, 25, 40 Ⓔ 17, 17, $17\sqrt{2}$

6. MULTIPLE CHOICE The length of a diagonal of a square is 16 inches. What is its perimeter?

Ⓐ $8\sqrt{2}$ in. Ⓑ $16\sqrt{2}$ in. Ⓒ $30\sqrt{2}$ in. Ⓓ $32\sqrt{2}$ in. Ⓔ $48\sqrt{2}$ in.

7. MULTIPLE CHOICE Use the diagram below to find the values of x and y. The values are rounded to the nearest tenth.

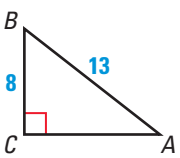


Ⓐ $x = 8.7$, $y = 18.8$
Ⓑ $x = 18.8$, $y = 20.1$
Ⓒ $x = 14.4$, $y = 19.2$
Ⓓ $x = 12.6$, $y = 18.5$
Ⓔ $x = 18.8$, $y = 20.5$

8. MULTIPLE CHOICE The base of an isosceles triangle is 18 centimeters long. The altitude to the base is 12 centimeters long. What is the approximate measure of a base angle of the triangle?

Ⓐ 53.1° Ⓑ 36.9° Ⓒ 38.7° Ⓓ 33.7° Ⓔ 56.3°

9. MULTIPLE CHOICE In the diagram below, what is the measure of $\angle A$ to the nearest tenth of a degree?



Ⓐ 31.6° Ⓑ 38.0° Ⓒ 38.7° Ⓓ 51.3° Ⓔ 52.0°

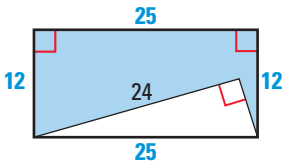
10. MULTIPLE CHOICE Let $\vec{v} = \langle -2, y \rangle$ and $\vec{w} = \langle x, 4 \rangle$. If $\vec{v} + \vec{w} = \langle 6, 11 \rangle$, what are the values of x and y?

Ⓐ $x = 8$, $y = 8$ Ⓑ $x = 8$, $y = 7$ Ⓒ $x = 7$, $y = 8$ Ⓓ $x = -8$, $y = 7$ Ⓔ $x = 4$, $y = 7$

11. MULTIPLE CHOICE Points $A(-8, 3)$ and $B(1, -9)$ are the initial and the terminal points of $\overrightarrow{AB}$. Find the magnitude of $\overrightarrow{AB}$.

Ⓐ $\langle 9, -12 \rangle$ Ⓑ $\langle -9, 12 \rangle$ Ⓒ 225 Ⓓ 15 Ⓔ $\langle -7, -6 \rangle$

MULTI-STEP PROBLEM In Exercises 12–14, use the diagram at the right.

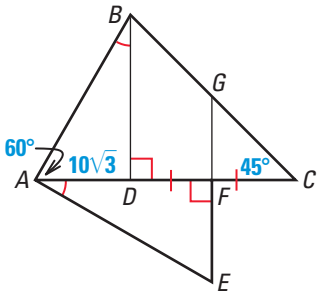


12. Find the perimeter of the right triangle.

13. Find the measures of the acute angles of the right triangle.

14. Find the area of the shaded region.

MULTI-STEP PROBLEM In Exercises 15–18, use the diagram at the right. Round decimals to the nearest tenth.



15. Find each of the following segment lengths: BD, BC, FG, GC, DC, and AF.

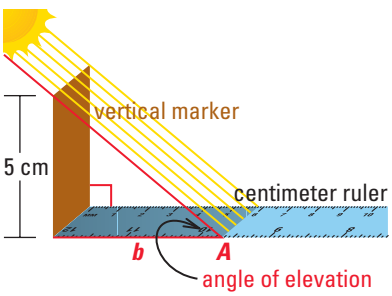
16. Find $m\angle ABC$, $m\angle FEA$, and $m\angle BGF$.

17. Find the approximate lengths of $\overline{FE}$ and $\overline{AE}$.

18. Find the area of $\triangle ABC$.

MULTI-STEP PROBLEM In Exercises 19–22, use the information and the diagram.

You can use a device like the one shown to measure the sun's angle of elevation, $\angle A$, above the horizon. The variable b represents the length of the shadow cast by a vertical marker on a ruler.



19. Find the shadow length b for each of the angle measures below.

a. $m\angle A = 30°$

b. $m\angle A = 40°$

c. $m\angle A = 50°$

d. $m\angle A = 60°$

e. $m\angle A = 70°$

20. Based on your answers to Exercise 19, what happens to the value of b as the sun rises in the sky?

21. At a certain hour, the shadow length b is 5.25 centimeters. Estimate the sun's angle of elevation.

22. The amount of Earth's atmosphere that sunlight passes through depends on the position of the sun in the sky. This amount is measured in "air masses." When the sun is not directly overhead, the number of air masses its rays pass through is approximately $\frac{1}{\sin A}$. What happens to the value of this expression as the sun approaches the horizon?