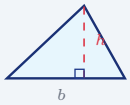
Area of Triangles

Name: _____	Date: _____	Score: _____ / 30

Quick Review and Helpful Hints

The area of a triangle is $A = \frac{1}{2}bh$, where b is the base and h is the height *perpendicular* to that base. Multiply the base by the height, then take half. Give the answer in square units.

▷ **Example:** Find the area of a triangle with base 6 and height 4.
Work: $A = \frac{1}{2}bh = \frac{1}{2}(6)(4) = \frac{1}{2}(24)$. ★ **Answer:** 12



$A = \frac{1}{2}bh.$

Practice Problems

Find each area.

1. $b = 4,\ h = 3$ _____

2. $b = 10,\ h = 6$ _____

3. $b = 8,\ h = 5$ _____

4. $b = 12,\ h = 4$ _____

5. $b = 5,\ h = 2$ _____

6. $b = 9,\ h = 6$ _____

7. $b = 7,\ h = 8$ _____

8. $b = 20,\ h = 10$ _____

9. $b = 3,\ h = 4$ _____

10. $b = 14,\ h = 5$ _____

11. $b = 6,\ h = 9$ _____

12. $b = 2,\ h = 2$ _____

13. $b = 16,\ h = 4$ _____

14. $b = 11,\ h = 2$ _____

Word Problems

15. A triangular sail has base 6 m and height 8 m. Find its area. _____

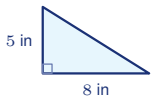
16. A triangle has base 10 in and height 3 in. Find its area. _____

17. A triangular garden has base 12 ft and height 5 ft. Find its area. _____

18. A school club cuts a triangular banner with base 9 cm and height 4 cm, then checks the area before printing. What area will be printed? _____

Illustrated Practice

Use each picture. Identify the base and perpendicular height, then find the area or missing measure.



19. Find the area of the right triangle.

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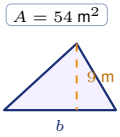

25. Find the missing base.

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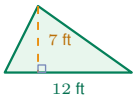

20. The dashed segment is the height. Find the area.

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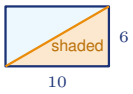

26. The shaded triangle is half the rectangle. Find its area.

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21. Find the area of the triangle on the grid.

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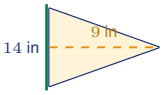

27. A pennant is triangular. Find its fabric area.

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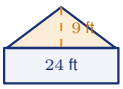

22. A roof face is triangular. Find its area.

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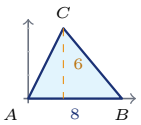

28. Find the area of triangle ABC.

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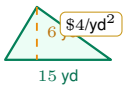

23. Mulch costs $\$4$ per square yard. Find the cost.

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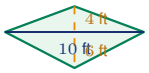

29. A kite has two triangular panels. Find the total area.

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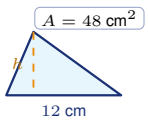

24. Find the missing height.

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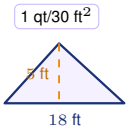

30. Paint is sold by the quart. How many whole quarts are needed?

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Answer Keys

1. 6	**11.** 27	**21.** 12 units^2
2. 30	**12.** 2	**22.** 108 ft^2
3. 20	**13.** 32	**23.** \$180
4. 24	**14.** 11	**24.** 8 cm
5. 5	**15.** 24 m^2	**25.** 12 m
6. 27	**16.** 15 in^2	**26.** 30
7. 28	**17.** 30 ft^2	**27.** 63 in^2
8. 100	**18.** 18 cm^2	**28.** 24 units^2
9. 6	**19.** 20 in^2	**29.** 50 ft^2
10. 35	**20.** 42 ft^2	**30.** 2 quarts

Step-by-Step Explanations

1. For triangle area, always multiply the base by the perpendicular height, then take half: $A = \frac{1}{2}(4)(3) = \frac{1}{2}(12) = 6$. The area is 6 square units.

2. Use $A = \frac{1}{2}bh$. Here the base is 10 and the height is 6, so $A = \frac{1}{2}(10)(6) = 30$.

3. The height is the straight-up-and-down distance to the base, so plug in $b = 8$ and $h = 5$: $A = \frac{1}{2}(8)(5) = 20$.

4. Multiply first, then divide by 2: $12 \cdot 4 = 48$, and half of 48 is 24. So the area is 24.

5. Use the same formula with $b = 5$ and $h = 2$: $A = \frac{1}{2}(5)(2) = 5$.

6. The base-height product is $9 \cdot 6 = 54$. A triangle is half of that rectangle, so $A = 27$.

7. Start with $A = \frac{1}{2}bh$: $A = \frac{1}{2}(7)(8) = \frac{1}{2}(56) = 28$.

8. The rectangle with the same base and height would have area $20 \cdot 10 = 200$. The triangle is half, so its area is 100.

9. Use $b = 3$ and $h = 4$: $A = \frac{1}{2}(3)(4) = 6$.

10. Multiply 14 by 5 to get 70, then take half. The triangle's area is 35.

11. With base 6 and height 9, $A = \frac{1}{2}(6)(9) = \frac{1}{2}(54) = 27$.

12. Even a small triangle uses the same rule: $A = \frac{1}{2}(2)(2) = 2$.

13. The base-height product is $16 \cdot 4 = 64$. Half of 64 is 32, so the area is 32.

14. Use $A = \frac{1}{2}(11)(2)$. Since half of 22 is 11, the area is 11.

15. For the sail, the base is 6 m and the height is 8 m. So $A = \frac{1}{2}(6)(8) = 24$, and the area is 24 m^2.

16. Substitute the base and height: $A = \frac{1}{2}(10)(3) = 15$. Because the measurements are inches, the answer is 15 in^2.

17. The garden has base 12 ft and height 5 ft, so $A = \frac{1}{2}(12)(5) = 30$. The area is 30 ft^2.

18. For the banner, use $b = 9$ cm and $h = 4$ cm: $A = \frac{1}{2}(9)(4) = 18$. The printed area will be 18 cm^2.

19. The right-angle mark shows the base and height are perpendicular. Use $A = \frac{1}{2}(8)(5) = 20$, so the area is 20 in^2.

20. The triangle is slanted, but the dashed segment gives the true height. So $A = \frac{1}{2}(12)(7) = 42$ ft^2.

21. The grid shows a base of 6 units and a height of 4 units. Half of $6 \cdot 4 = 24$ is 12, so the area is 12 units^2.

22. Only the triangular roof face is needed. Use base 24 ft and height 9 ft: $A = \frac{1}{2}(24)(9) = 108$ ft^2.

23. First find the garden area: $A = \frac{1}{2}(15)(6) = 45$ yd^2. At \$4 per square yard, the cost is $45 \cdot 4 = \$180$.

24. This time the area is given, so work backward: $48 = \frac{1}{2}(12)h = 6h$. Divide by 6 to get $h = 8$ cm.

25. Use the area formula and solve for the base: $54 = \frac{1}{2}(b)(9) = 4.5b$. Dividing 54 by 4.5 gives $b = 12$ m.

26. The diagonal cuts the 10 by 6 rectangle into two equal triangles. The rectangle area is 60, so the shaded triangle is 30.

27. For the pennant, use the vertical side as the base and the dashed horizontal distance as the height: $A = \frac{1}{2}(14)(9) = 63$ in^2.

28. On the coordinate picture, the base is 8 units and the height is 6 units. The area is $A = \frac{1}{2}(8)(6) = 24$ units^2.

29. The kite is made from two triangles that share the 10-ft base. Their heights are 4 ft and 6 ft, so the total area is $\frac{1}{2}(10)(4) + \frac{1}{2}(10)(6) = 20 + 30 = 50$ ft^2.

30. The mural area is $\frac{1}{2}(18)(5) = 45$ ft^2. One quart covers 30 ft^2, so $45 \div 30 = 1.5$ quarts; since paint is sold by whole quarts, buy 2 quarts.

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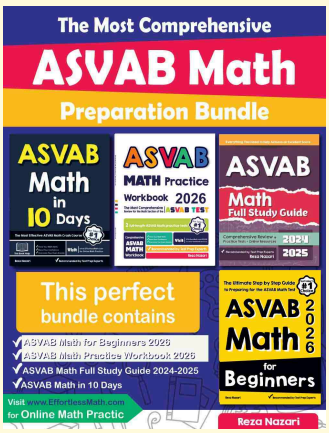

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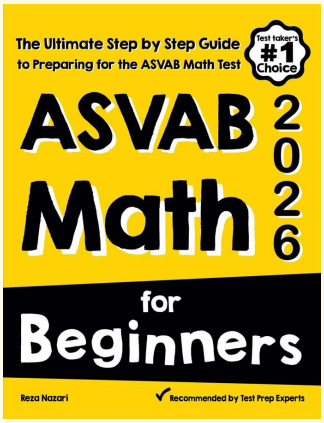

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