

Name \_\_\_\_\_

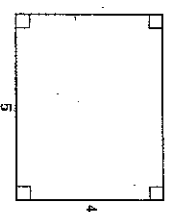
Date \_\_\_\_\_

**LESSON 11.1** Practice A  
For use with pages 720-726

Find the area of the rectangle.



1.

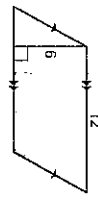


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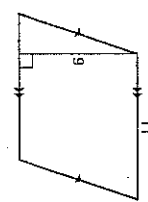


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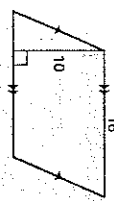
Find the area of the parallelogram.



4.

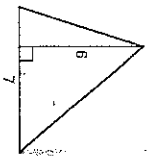


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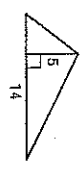


6.

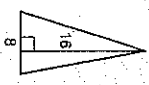
Find the area of the triangle.



7.

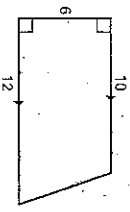


8.

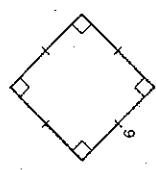


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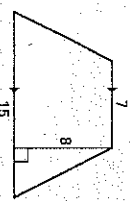
Find the area of the polygon.



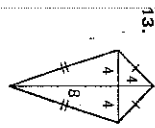
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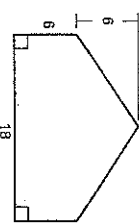
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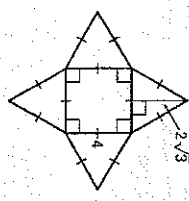
12.



13.



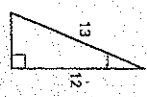
14.



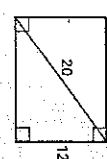
15.

**LESSON 11.1** Practice A *continued*  
For use with pages 720-726

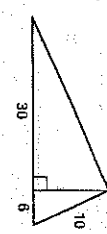
Use the Pythagorean Theorem to find the area of the polygon.



16.

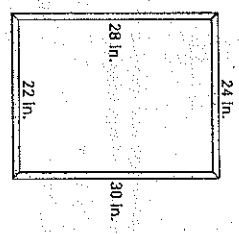


17.

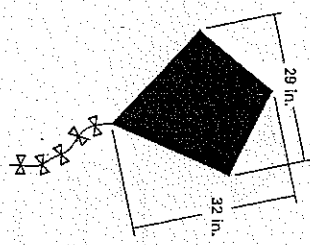


18.

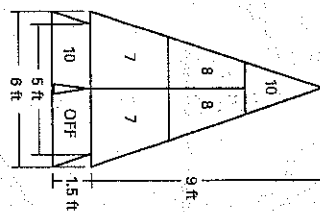
19. You frame a mirror as shown at the right. The width of each piece of the frame is 1 inch. Find the area of the frame.



20. Kites Find the area of the kite.



21. Shuffleboard Find the area of the scoring area.

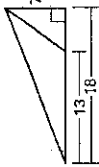
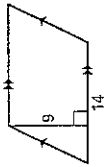
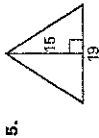
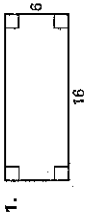


Name \_\_\_\_\_

Date \_\_\_\_\_

**LESSON 11.1**  
**Practice B**  
For use with pages 726-728

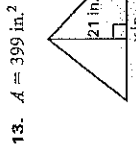
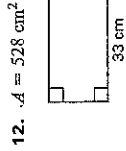
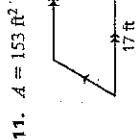
Find the area of the polygon.



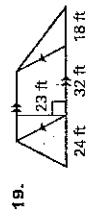
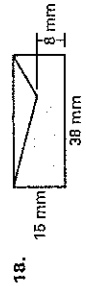
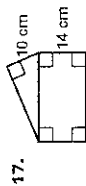
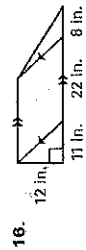
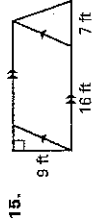
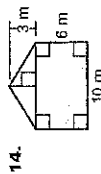
The lengths of the hypotenuse and one leg of a right triangle are given. Find the perimeter and area of the triangle.

7. Hypotenuse: 26 cm; leg: 24 cm  
8. Hypotenuse: 50 mm; leg: 14 mm  
9. Hypotenuse: 37 ft; leg: 12 ft  
10. Hypotenuse: 85 in.; leg: 77 in.

Find the value of  $x$ .



Find the area of the shaded polygon.



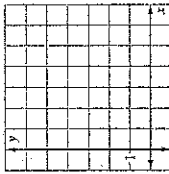
Name \_\_\_\_\_

Date \_\_\_\_\_

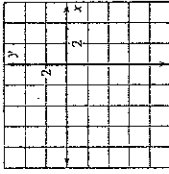
**LESSON 11.1**  
**Practice B**  
continued  
For use with pages 726-728

Graph the points and connect them to form a polygon. Find the area of the polygon.

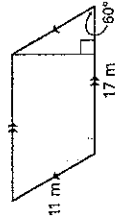
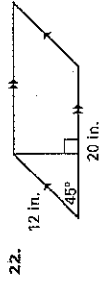
20.  $A(2, 2), B(3, 6), C(5, 6), D(4, 2)$



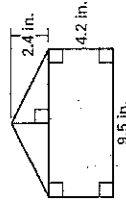
21.  $P(-4, -4), Q(-1, -1), R(5, -4)$



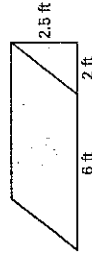
Find the height and area of the polygon.



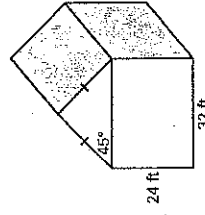
24. Envelopes You have an envelope that is 9.5 inches by 4.2 inches and has a triangular flap with a height of 2.4 inches. What is the area of the envelope shown in the diagram?



25. Floor Tile You have a piece of floor tile in the shape of a parallelogram that has a base of 6 feet and a height of 2.5 feet. You cut a triangular piece of tile with a base of 2 feet to fit next to the other piece, as shown. Find the total area of the tile in square feet and square inches.

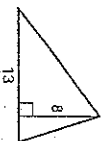
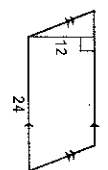
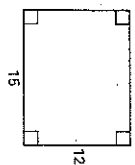


26. Painting A painter is painting the back of your garage, which has the measurements shown. The painter can paint 200 square feet per hour and charges \$25 per hour. How much will you have to pay if the painter rounds the time spent painting to the nearest half hour?



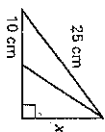
**LESSON 11.1 Practice C**  
For use with pages 720–726

Find the area of the polygon.

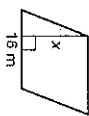


Find the value of  $x$ .

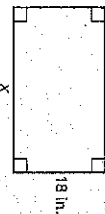
4. Area = 70 cm<sup>2</sup>



5. Area = 104 m<sup>2</sup>



6. Area = 576 in.<sup>2</sup>



The lengths of the hypotenuse and one leg of a right triangle are given. Find the perimeter and area of the triangle.

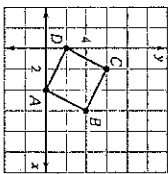
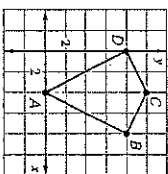
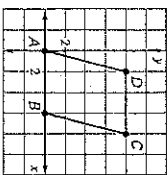
7. Hypotenuse: 17 ft; leg: 8 ft

8. Hypotenuse: 53 in.; leg: 45 in.

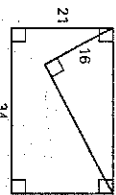
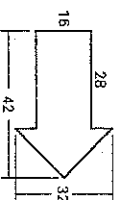
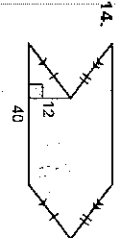
9. Hypotenuse: 65 cm; leg: 56 cm

10. Hypotenuse: 85 mm; leg: 36 mm

Find the area of the quadrilateral.



Find the area of the shaded polygon.



**LESSON 11.1 Practice C** *continued*  
For use with pages 720–726

17. Algebra The area of a triangle is 225 square units. The base of the triangle is twice the height. Find the base and the height.

18. Algebra The area of a parallelogram is 216 square centimeters. The height of the parallelogram is two thirds its base. Find the base and the height.

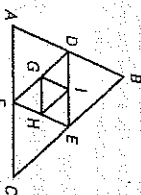
19. Algebra The area of a square is 256 square units. Find the side length and perimeter of the square.

20. Algebra The area of a rectangle is 84 square inches. The length of the rectangle is 2 inches longer than twice the width. Find the width and the perimeter of the rectangle.

21. Trigonometry In  $\square ABCD$ , base  $\overline{AD}$  is 25 units and  $\overline{AB}$  is 12 units. Find the height and area of  $\square ABCD$  if  $m\angle A$  is  $30^\circ$ .

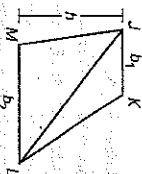
22. Trigonometry In  $\square EFGH$ , base  $\overline{EH}$  is 15 units and  $\overline{EF}$  is  $6\sqrt{2}$  units. Find the height and area of  $\square EFGH$  if  $m\angle E$  is  $45^\circ$ .

23. In the figure at the right,  $D$ ,  $E$ ,  $F$ ,  $G$ ,  $H$ , and  $I$  are midpoints of segments. The area of  $\triangle GHI$  is 12 square units. Find the area of  $\triangle ABC$ .

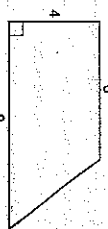


24. Area of a Trapezoid Use the figure at the right to write a plan for a proof of the area of a trapezoid.

**GIVEN:**  $JKLM$  is a trapezoid with bases  $\overline{JK}$  and  $\overline{ML}$ .  
**PROVE:** The area of  $JKLM$  is  $\frac{1}{2}h(b_1 + b_2)$ .



25. Justify Use the trapezoid at the right to justify your plan in Exercise 24.



26. Heron's Formula Another way to find the area of a triangle is to use Heron's Formula. The formula is  $A = \sqrt{s(s-a)(s-b)(s-c)}$  where  $A$  is the area of the triangle,  $a$ ,  $b$ , and  $c$  are side lengths, and  $s$  is one half the perimeter of the triangle. Use the triangle at the right to justify Heron's Formula.



# Answers

## Lesson 11.1

### Teaching Guide

1. The area of a rectangle is the base times the height. 2. A parallelogram can be transformed into a rectangle by creating a right triangle by drawing a perpendicular line to the opposite base from a vertex that has an obtuse angle. Physically remove/cut this triangle from the parallelogram. Adjoin this triangle to the opposite end in the original orientation. Show the class that the new shape is a rectangle with the same dimensions from question one. The area of the parallelogram is equal to the area of the rectangle.

3. To create a parallelogram from a triangle you need to duplicate the original triangle and adjoin a side of the new triangle with the corresponding side of the original triangle. Physically adjoin the two triangles and show the class that the result is a parallelogram. The area of the original triangle is half the area of the parallelogram.

### Technology Activity

1. Answers will vary. 2. The area of a parallelogram is twice the area of a triangle. 3. The formula for the area of a parallelogram is  $A = bh$ .

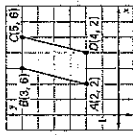
### Practice Level A

- 27 square units
- 20 square units
- 120 square units
- 72 square units
- 99 square units
- 160 square units
- 21 square units
- 35 square units
- 64 square units
- 66 square units
- 81 square units
- 88 square units
- 48 square units
- 162 square units
- $16 + 16\sqrt{3}$  square units
- 30 square units
- 192 square units
- 144 square units
- 104 in.<sup>2</sup>
- 464 in.<sup>2</sup>
- 35.25 ft<sup>2</sup>

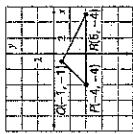
### Practice Level B

- 96 square units
- 121 square units
- 126 square units
- 96 square units
- 142.5 square units
- 45.5 square units
- 60 cm; 120 cm<sup>2</sup>
- 112 mm; 336 mm<sup>2</sup>
- 84 ft; 210 ft<sup>2</sup>
- 198 in.; 1386 in.<sup>2</sup>
- 9
- 12.16
- 3.38
- 4.75 m<sup>2</sup>
- 175.5 ft<sup>2</sup>
- 378 in.<sup>2</sup>
- 484 cm<sup>2</sup>
- 437 mm<sup>2</sup>

19. 1219 ft<sup>2</sup>



20.  $\frac{1}{2}(9)(6)$



8 square units

13.5 square units

22. 8.485 in.; 169.706 in.<sup>2</sup>

23. 9.526 m; 161.947 m<sup>2</sup>

24. 51.3 in.<sup>2</sup>

25. 17.5 ft<sup>2</sup>; 2520 in.<sup>2</sup>

### Practice Level C

1. 180 square units

2. 288 square units

3. 52 square units

4. 14 cm

5. 6.5 m

6. 32 in.

7.  $P = 40$  ft;  $A = 60$  ft<sup>2</sup>

8.  $P = 126$  in.;  $A = 630$  in.<sup>2</sup>

9.  $P = 154$  cm;  $A = 924$  cm<sup>2</sup>

10.  $P = 198$  mm;  $A = 1386$  mm<sup>2</sup>

11. 48 square units

12. 40 square units

13. 20 square units

14. 960 square units

15. 672 square units

16. 474 square units

17. 15; 30

18. 18 cm; 12 cm

19. 16; 64

20.  $w = 6$  in.;  $P = 40$  in.

21. 6; 150

22. 6; 90

23. 192 square units

24. *Sample answer:* Area of  $\triangle JKL = \frac{1}{2}bh$ ;

Area of  $\triangle JLM = \frac{1}{2}b_1h$ ; Area of  $\triangle JLM = \frac{1}{2}b_2h$  + Area of  $\triangle JLM =$

$\frac{1}{2}b_1h + \frac{1}{2}b_2h = \frac{1}{2}h(b_1 + b_2)$

25. *Sample answer:* Divide the trapezoid into 2 triangles.

Area of  $\triangle 1 = \frac{1}{2}(6)(4) = 12$

Area of  $\triangle 2 = \frac{1}{2}(9)(4) = 18$

The sum of the areas of both triangles is 30.

Now, use the formula:

Area:  $\frac{1}{2}h(b_1 + b_2) = \frac{1}{2}(4)(6 + 9) = 30$ .

The areas are equal.