Answer Key: Chapter 4 Areas of Polygons, Section 4.1

1. The area of a polygon is the amount of surface it covers. The perimeter of a polygon is the distance around the polygon.

2. *Answer should include, but is not limited to:* Students should construct the parallelogram to actual size. The most common method will be to use a ruler. However, some may use grid paper, a software program, or something else.

3. 18 ft^2

4. 840 mm^2

5. 187 km^2

6. 3750 cm^2

7. 243 $in.^2$

8. 894 mi^2

9. 15 meters was used for the height instead of 13 meters.
$A = 8(13) = 104\ m^2$

10. 6 $in.^2$

11. 12 $units^2$

12. 9 $units^2$

13. 24 $units^2$

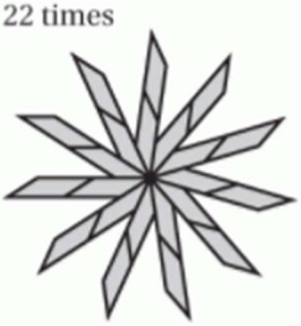
14. 64 cm^2

15. 72 m^2

16. 96 ft^2

17. See *Taking Math Deeper.*

18. 22 times



19. 287 $in.^2$

20.

Parallelogram	Base	Height	Area
A	$x + 4$	5	$5x + 20$
B	$x - 3$	8	$8x - 24$
C	6	$2x + y$	$12x + 6y$

21. n^2bh where b represents the base and h represents the height of the original parallelogram, or n^2A where A represents the area of the original parallelogram.

Chapter 4 Araes of Polygons section 4.1 continued

21. n^2bh where b represents the base and h represents the height of the original parallelogram, or n^2A where A represents the area of the original parallelogram.

22. 13

23. 1640

24. 480

25. 118

26. B

Answer Key Section 4.2 Area of Triangles (keep scrolling down)

1. yes; To find the area of the triangle, you must also know the height of the triangle. That is, the perpendicular distance from the base to the opposite vertex.

2. What is the distance around the triangle?;
18 units; 12 units^2

3. 6 cm^2

4. 40 ft^2

5. 1620 in.^{2}

6. 154 yd^2

7. 1125 cm^2

8. 132 m^2

9. The side length of 13 meters was used instead of the height.

$A = \frac{1}{2}(10)(12) = 60$ m^2

10. about 10 in.^{2}

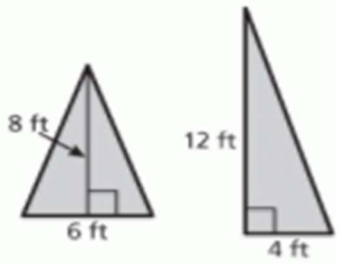
11. 324 cm^2

12. 68 m^2

13. 90 mi^2

14. 189 mm^2

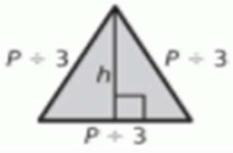
15. *Sample answer:*



16. See *Taking Math Deeper.*

17. x^2 times greater

18. Find the length of the base by dividing the perimeter by 3. Then multiply one-half of the base by the height.



19. 4 times greater

20. 6 ft

21. Mult. Prop. of One

22. Comm. Prop. of Mult.

23. Assoc. Prop. of Add.

24. C

Answer Key Section 4.3 Area of Trapezoids

1. bases: 4 ft and 7 ft; height: 15 ft

2. height h and bases b_1 and b_2

3. $2\ell + 2w$; This is an expression for the perimeter of a rectangle. The other three are expressions for area (triangle, rectangle, and trapezoid).

4. 12 units^2

5. 24 units^2

6. 27 units^2

7. 28 in.^{2}

8. 10 cm^2

9. 105 ft^2

10. The height was not included in the formula.

$A = \frac{1}{2}(8)(6 + 14) = 80$ m^2

11. 8 units^2

12. 16 units^2

13. 12 units^2

14. 16 ft^2

15. 60 in.^{2}

16. 253 cm^2

17. 78 mi^2

18. 301 m^2

19. 18 ft

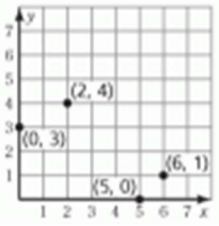
20. *Sample answers:*
$b_1 = 2$ ft, $b_2 = 3$ ft;
$b_1 = 1.5$ ft, $b_2 = 3.5$ ft

21. See *Taking Math Deeper.*

22. **a.** $x > 0$ and $x < 15$ inches; For $x = 15$ inches the area of the trapezoid is twice the area of the triangle, so x must be less than 15 inches.

b. no; When $x = 15$ inches the quadrilateral is a rectangle, not a trapezoid.

23–26.



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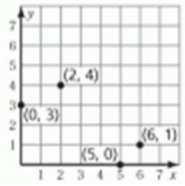

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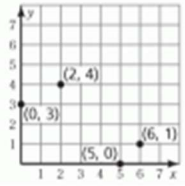

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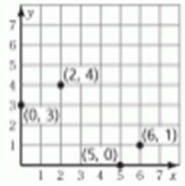

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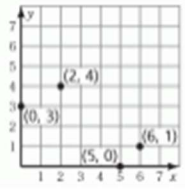


27. C

Answer Key: 4.4 Polygons/Coordinate Plane

(scroll down)

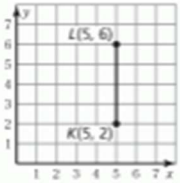
1. Plot the points that represent the vertices of the polygon and connect the points in order.

2. Assume that all of the sides are vertical or horizontal. Find the points with the same y-coordinates. Subtract the x-coordinates of those points to find the length of the horizontal sides. Find the points with the same x-coordinates. Subtract the y-coordinates of those points to find the length of the vertical sides. Last, add the lengths of all four sides to find the perimeter.

3.

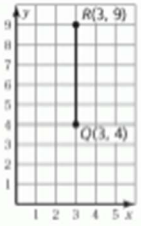
Length of CD is 8 units.

4.



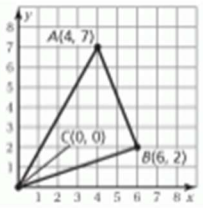
Length of KL is 4 units.

5.



Length of QR is 5 units.

6.



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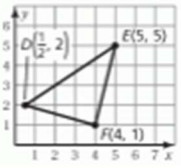

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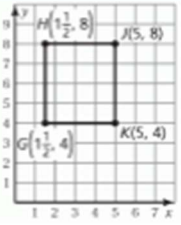

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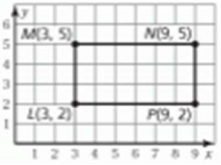

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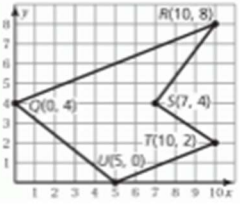

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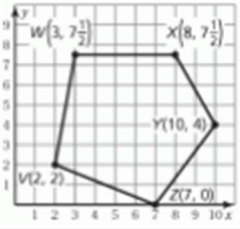


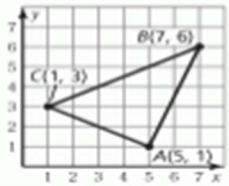
12. 12 units; 9 units²

13. 24 units; 36 units²

14. 16 units; 15 units²

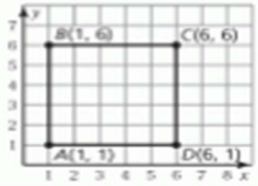
15. 28 units; 45 units²

16. The x- and y-coordinates are revers

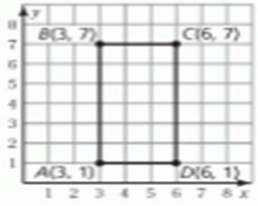


17. **a.** square **b.** 28 ft; 49 ft²

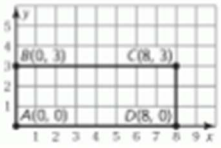
18. *Sample answer:*



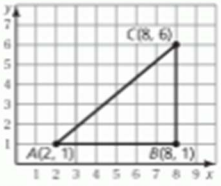
19. *Sample answer:*



20. *Sample answer:*



21. *Sample answer:*



22. *Sample answer:* (6, 1) and (8, 9)

23. 27 miles; There are only two ways to go from station P to station L. Traveling from station P t N to M to L is 27 miles. Traveling from station P to J to K to L is 33 miles.

24. 41 mi²

25. 2.5 times larger

26. See *Taking Math Deeper.*

27. 2

28. $8\frac{4}{5}$

29. $\frac{5}{16}$

30. $3\frac{19}{27}$

31. D