

**Warm Up 120**

1. rotation
2. All angles are right angles and opposite sides are congruent and parallel. They both have congruent diagonals.
3. D

**Lesson Practice 120**

- a. Yes, both divide a two-dimensional space into three regions.
- b. B
- c. no division:  $\{1, 2, 3, 5, 7\}$ ;  
two regions:  $\{4, 6, 9, 0\}$ ;  
three regions:  $\{8\}$

## Practice 120

1. point matrix:

$$\begin{bmatrix} -2 & 4 & 6 \\ 3 & 8 & -1 \end{bmatrix};$$

transformation matrix:

$$\begin{bmatrix} 4 & 4 & 4 \\ -3 & -3 & -3 \end{bmatrix}$$

2. a circle

3. D

4. Possible answer: Place the vertices of the square at
- $(0, s)$
- ,
- $(0, 0)$
- ,
- $(s, s)$
- and
- $(s, 0)$
- . Then use the determinant area formula:

$$A = \frac{1}{2}((0)(s) + (0)(s) + (s)(0) + (s)(0) - (0)(0) - (s)(s) - (0)(0)).$$

This simplifies to  $-s^2$ . Taking the absolute value yields  $s^2$ .

- 5.
- $x = 32$
- ;
- $m\widehat{KJ} = 91^\circ$

6. Sample: no; performing the rotation first and then the reflections results in a different image than performing the transformations in the order given.

- 7.
- $40^\circ$

8. It is not true. For example
- $\theta = 50^\circ$
- makes the equation untrue.

9. 6

10. 25.5 square units

- 11.
- $1.91^\circ$

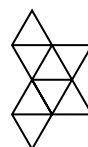
12. 4

13. A soccer ball is made up of pentagons and hexagons. Therefore, its faces are not congruent, so it cannot be a Platonic solid.

14. A

- 15.
- $x = 4.8$

16. Sample:



17.  $2826 \text{ cm}^2$
18.  $604 \text{ yd}^2$
19.  $XY = 3.6$ ,  $XZ = 6.1$ ,  $YZ = 4.5$ ,  $m\angle X = 47^\circ$ ,  
 $m\angle Y = 97^\circ$ ,  $m\angle Z = 36^\circ$
20. horizontal: 6.82 lbs; vertical: 9.83 lbs
21.  $\frac{a+b+c+d}{4}$ ; The midpoint of these two midpoints is the average (mean) of the four values  $a$ ,  $b$ ,  $c$ , and  $d$ .
22. No, since no pushing or pulling of the string will undo the knot.
23.  $\left(\frac{x}{360}\pi - \frac{1}{2}\sin x^\circ\right)r^2$
- 24.
- | Statements                           | Reasons                              |
|--------------------------------------|--------------------------------------|
| 1. $A = bh_1$                        | 1. Area of parallelogram 1           |
| 2. $A = bh_2$                        | 2. Area of parallelogram 2           |
| 3. $bh_1 = bh_2$                     | 3. Substitution Property of Equality |
| 4. $\frac{bh_1}{b} = \frac{bh_2}{b}$ | 4. Division Property of Equality     |
| 5. $h_1 = h_2$                       | 5. Simplify                          |
25. He has assumed that the open can has a hole in it, but since the opening does not extend all the way through the can, it can be thought of as a very deep indentation, which is not a topologically distinct alteration to make.

26.  $3\sqrt{5}$
27. It is a weak positive correlation.
28. Yes. If force is applied to the spoon, tines could be pulled out of the curved part of the spoon, and the rest of the material redistributed to form the fork. The reverse could be true for a fork being forced into the shape of a spoon.
29. It does not matter; because  $m\angle 1 = m\angle 2$ , the triangle formed by the three players is isosceles and so Shirley is equidistant from both of the other players.

30.

