

**Warm Up 116**

1. function
2.  $m\angle A = 59^\circ$ ,  $m\angle B = 31^\circ$ ,  
 $m\angle C = 90^\circ$
3.  $x = 25.2$
4.  $y = 62.8$

**Lesson Practice 116**

- a.  $\sec \theta = \frac{z}{y}$ ,  $\csc \theta = \frac{z}{x}$ ,  
 $\cot \theta = \frac{y}{x}$
- b.  $\sqrt{3}$
- c.  $x = 2.40$  miles,  
 $y = 3.14$  miles

## Practice 116

- No, it will not break, because with the balloon's radius doubled, the new radius is 3.4 inches, so the elastic band, which acts as a circumference, will be stretched to only  $(2\pi)(3.4) \approx 21.4$  inches.
- $193 \text{ in}^2$
- C
- 3 units
- 3.6 miles per hour forward
- The only reason a system will have no solutions is if the lines are parallel. There is no solution because the lines never intersect on a plane.
- Sample:  $(3, 4)$  is in the region,  $(0, 0)$  is not
- Since  $\angle 1$  and  $\angle 2$  are complementary,  $m\angle 1 + m\angle 2 = 90^\circ$ . By the Vertical Angles Theorem,  $\angle 1 \cong \angle 3$ . Therefore,  $m\angle 1 = m\angle 3$ . By substitution,  $m\angle 2 + m\angle 3 = 90^\circ$ , so  $\angle 2$  and  $\angle 3$  are complementary.
- She has placed the z-coordinate first in her ordered triplet, when it should be last. The three-dimensional coordinates are  $(3, 2, 0)$  and  $(4, 5, 0)$ .
- $420.0 \text{ in}^3$
- isosceles triangle;  
 $10 + 2\sqrt{5}$
- The solution of a conjunction is the intersection of solutions, while the solution to a disjunction is the union of all the solutions. While the inequalities may have no solution in common, they always each have a solution, so the union cannot be empty.

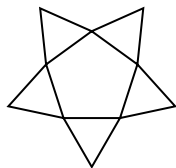
13. 208 mm

14.  $68.0 \text{ cm}^3$

15.  $x = 6.33$

16. They are not the same. The secant ratio never has a value between 1 and 0, because it is the reciprocal of the cosine ratio, and the reciprocal of a number less than 1 (which cosine always is) will always be greater than 1. A similar argument shows that secant cannot take a value between 0 and  $-1$ , and the same holds for cosecant. Neither can be equal to 0 because zero has no reciprocal.

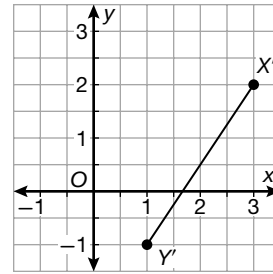
17. Sample:



18.  $10\sqrt{3}$

19.  $628.3 \text{ mm}^2$

20.



21.  $(-2, 0), y = 0$

22.  $\csc \theta = \frac{4}{a}, \sec \theta = \frac{4}{b},$   
 $\cot \theta = \frac{b}{a}$

23.  $x = 5.26$

24.  $\cos \theta = 0.6, \theta = 53^\circ$

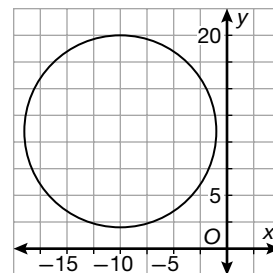
25. 19, 23, 29

26. a circle

27. Yes, the solid has rotational symmetry;  $30^\circ$ ; 12

28.  $\sin \theta = \sqrt{\frac{\sec^2 \theta - 1}{\sec \theta}}$

29.  $(x + 10)^2 + (y - 11)^2 = 81;$



30.

Statements	Reasons
1. $m\angle ABM = m\angle ACM$ , $m\angle AMB = 90^\circ$ , $m\angle ACM = 90^\circ$	1. Given
2. $m\angle AMB = m\angle AMC$	2. All right angles are congruent.
3. $AM = AM$	3. Symmetric Property of Equality
4. $\triangle BAM = \triangle CAM$	4. AAS Theorem