1. $\overline{XY}$ has endpoints at $X(3, -5)$ and $Y(-2, 1)$. What is the length of $\overline{XY}$?

2. What is the vector form of the translation that maps $\triangle JKL$ to $\triangle J'K'L'$?
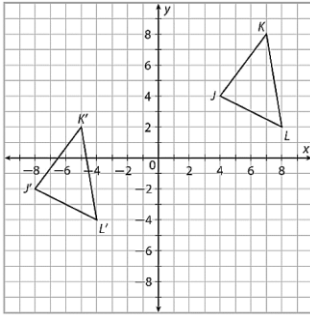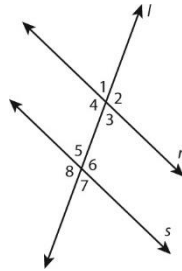

3. State the coordinate notation that describes the sequence of transformations from $ABCD$ to $A'B'C'D'$ to $A''B''C''D''$ to $A'''B''''C'''D'''$ in the graph below?
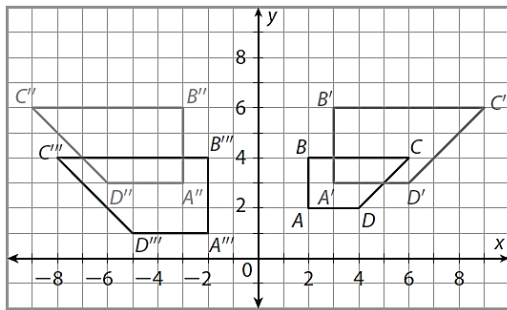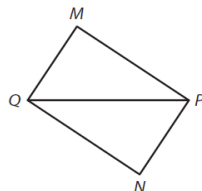

4. If r is parallel to s, which of these explains why $\angle 2 \cong \angle 6$?

   A   vertical angles theorem

   B   alternate interior angles theorem

   C   corresponding angles theorem

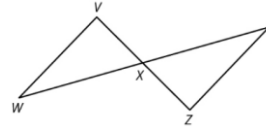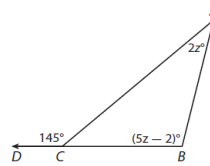   D   linear pair postulate

5. Look at the figure:

Given , $\angle MQP \cong \angle NPQ$ what additional information is needed to prove that $\triangle MQP$ is congruent to $\triangle NPQ$ by the SAS theorem?
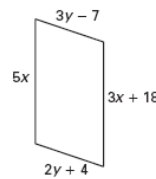

6. Point X is the midpoint of VZ. Can you conclude that $\triangle VWX$ is congruent to $\triangle ZYX$? If so, explain your answer. If there is not enough information, explain what additional information is needed.

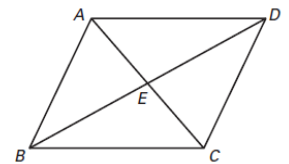7. In $\triangle ABC$ what is $m\angle B$?

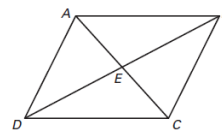8. Find the values of x and y given that figure is a parallelogram.

9. Decide whether each piece of given information alone is sufficient to prove the quadrilateral $ABCD$ is a parallelogram.

E is the midpoint of $\overline{AC}$ and $\overline{BD}$.

$m\angle ABC + m\angle BCD = 180°$

$\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \cong \overline{DA}$

$\angle ABC \cong \angle ADC$, and $\angle BAD \cong \angle BCD$

$\triangle ABE \cong \triangle DCE$

$\triangle ABE \cong \triangle CDE$

10. Quadrilateral $ABCD$ is a rhombus.

If $m\angle BAE = 32°$, find $m\angle ECD$.

If $m\angle EDC = 43°$, find $m\angle CBA$.

If $m\angle EAB = 57°$, find $m\angle ADC$.

If $m\angle BEC = 3x - 15°$, solve for x.

If $m\angle ADE = 5x - 8°$ and $m\angle CBE = 3x + 24$, solve for x.

If $m\angle BAD = 4x + 14°$ and $m\angle ABC = 2x + 10°$, solve for x.

11. Put an X in the box if the shape *always* has the given property.

| Property	▱	Rectangle	Rhombus	Square	Isosceles Trapezoid	Kite
1. Both pairs of opposite sides are congruent.						
2. Diagonals are congruent.						
3. Diagonals are perpendicular.						
4. Diagonals bisect one another.						
5. Consecutive angles are supplementary.						
6. Both pairs of opposite angles are congruent.						

12. The vertices of square *JKLM* are *J*(4, 4), *K*(6, 3), *L*(5,1), and *M*(3, 2). Find each of the following to show that the diagonals of square *JKLM* are congruent perpendicular bisectors of each other.

JL = _____   KM = _____
slope of $\overline{JL}$ = _____   slope of $\overline{KM}$ = _____
midpoint of $\overline{JL}$ = (____, ____) midpoint of $\overline{KM}$ = (____, ____)

13 . Which of the following quadrialterals have the given property?

All sides are congruent.   A. Parallelogram

All angles are congruent.   B. Rectangle

The diagonals are congruent.   C. Rhombus

Opposite angles are congruent.   D. Square
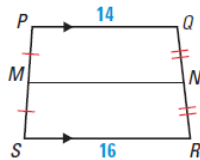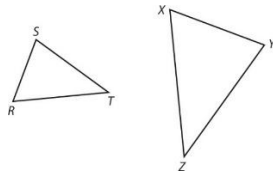

14. In trapezoid PQRS, find MN.

15.

Draw a trapezoid *JKLM* with *JK* ∥ *LM*. Match the pair of segments or angles with the term, which describes them in trapezoid *JKLM*.

$\overline{JK}$ and $\overline{ML}$	$\overline{MJ}$ and $\overline{KL}$	$\overline{ML}$ and $\overline{KL}$
∠K and ∠M	$\overline{JL}$ and $\overline{KM}$	∠M and ∠L

A. bases angles   B. consecutive sides   C. opposite angles
D. diagonals   E. bases   F. legs

16. In this figure, triangle *RST* is similar to triangle *XYZ*. Which of the following is true?
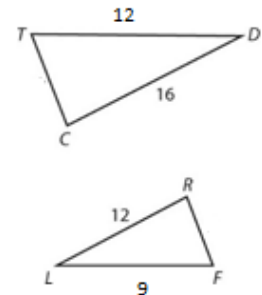

A $\dfrac{RS}{RT} = \dfrac{ST}{YZ}$ C $\dfrac{RT}{XZ} = \dfrac{RS}{YZ}$

B $\dfrac{RS}{XZ} = \dfrac{ST}{XY}$ D $\dfrac{RT}{XZ} = \dfrac{RS}{XY}$

17. Lindsey is 5 feet tall. At a certain time of day, she casts a shadow that is 15 feet long. At the same time, a tree casts a shadow that is 60 feet long. Find the height of the tree.
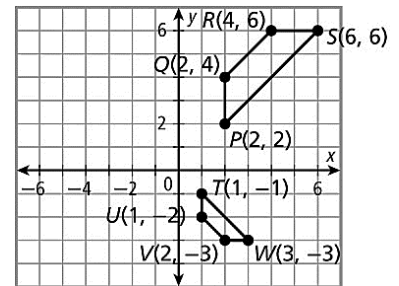

5 ft   15 ft   60 ft

18. Which additional piece of information that is sufficient to prove that the triangles are similar.
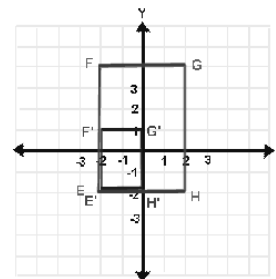
A $TD \cong FL$

B $\angle C \cong \angle R$

C $\angle T \cong \angle F$

D $\angle D \cong \angle L$

19. Using coordinate nota   transformations will map t   d
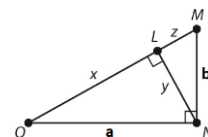figure PQRS.

20. Rectangle *EFGH* was dilated to create rectangle *E′F′G′H′*. What is the scale factor of the dilation?
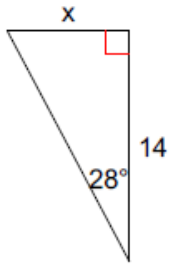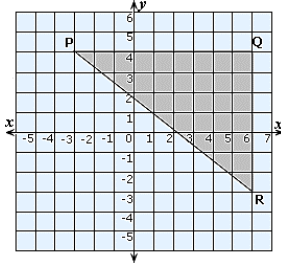

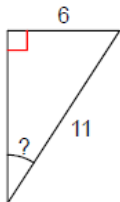21. Fill in the blank.

$$\frac{\square}{y} = \frac{y}{z}$$

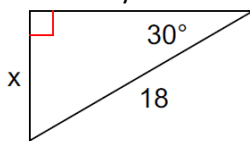22. Find the value of X to the nearest tenth.

X

14

28°

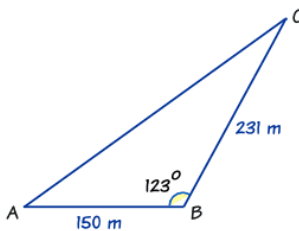23. Find the length of the hypotenuse and the measure of Angle R.

P · Q

R
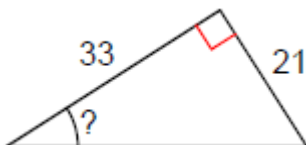
24. Find the measure of the missing angle.

6

11

?

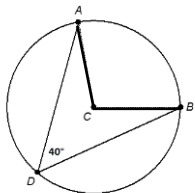25. What are the missing side lengths in $\triangle TSU$? Keep your answers in simplest radical form.
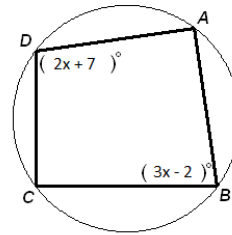
30°

x

18

26. Find the area of triangle ABC

C

231 m

123°

A

150 m

B

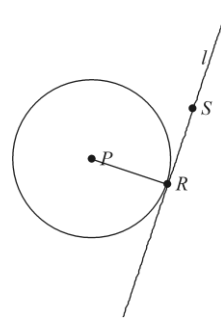27. Find the angle measure of to the nearest tenth.

33

21

?

28. What is the measure of $\angle ACB$ below?

A

C

B

40°

D

29. Quadrilateral ABCD is circumscribed by a circle, as shown in the diagram to the right. What is the measure of angle B?
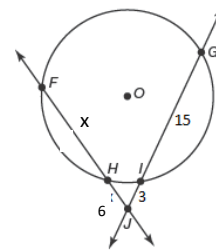
D

$(2x + 7)°$

A

$(3x - 2)°$

C

B

30. Line l is tangent to circle P. Determine if each statement is TRUE or FALSE.

l

S

P
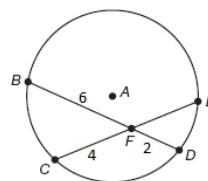
R

A) $\overline{SR}$ is the same length as $\overline{PR}$.
B) $m\angle PRS = 90°$
C) Line l is tangent to circle P at the point of tangency R.
D) Line l intersects circle P exactly once.
E) Line l is perpendicular to $\overline{PR}$

31. Secants $\overline{FH}$ and $\overline{GI}$ intersect at point J. Solve for x.

G

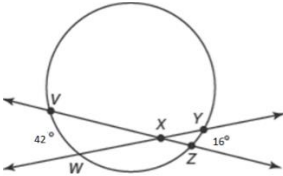F

· O

x

15

H

6

3

J

32. In circle A, chords $\overline{BD}$ and $\overline{CE}$ intersect at point F. The lengths in feet of each segment are shown. What is the length of $\overline{FE}$?
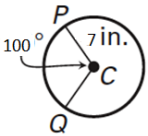
B

6

· A

E

C

4

F 2

D

33. If $m\widehat{ML} = 120°$ and $m\widehat{NO} = 10°$, what is the $\angle MPL$?
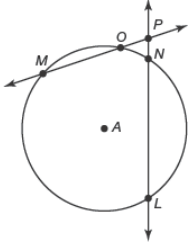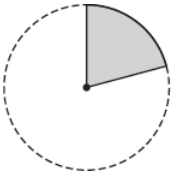

34. If $m\widehat{WV} = 42°$ and $m\widehat{YZ} = 16°$, what is the measure of $\angle VXW$?

35. Find the arc length of $\widehat{PQ}$ to the nearest hundredth.

36. Part of an ancient circular plate was discovered. Only a 60° section of it was left. If the plate had a radius of 4 inches, what was the area of this sector of the plate?

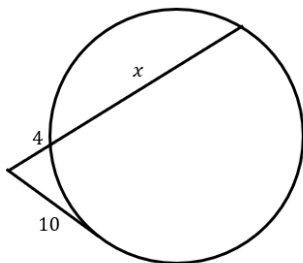37. The circular path of cars on a Ferris wheel can be modeled with the equation

$x^2 - 12x + y^2 - 100y = -36$, measured in feet.

What is the maximum height above ground of the riders?

38. Write the equation of a circle with center M(-5,3) and radius 4

39. Find x.

40. Find the circumference of a circle with an area of 400π ft².

41. Which point lies on the circle that is centered ate the origin and contains the point (0, 7)?
   A) $\left(-6, \sqrt{13}\right)$
   B) $\left(-2, \sqrt{3}\right)$
   C) $\left(\sqrt{12}, -1\right)$
   D) $\left(\sqrt{15}, 5\right)$
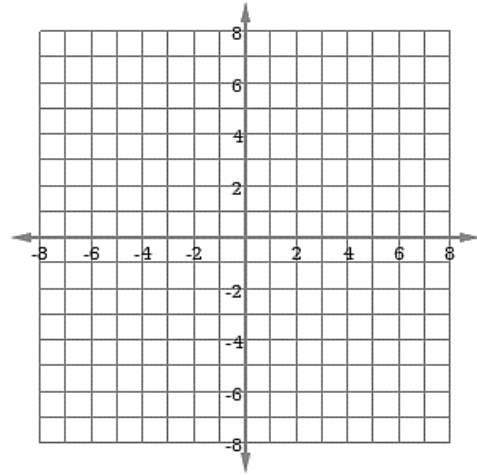
42. Find the center and radius of the circle by completing the square twice.

$$x^2 - 10x + y^2 + 2 = 38$$

43. Find the length of XZ. Leave your answer in simplest radical form.
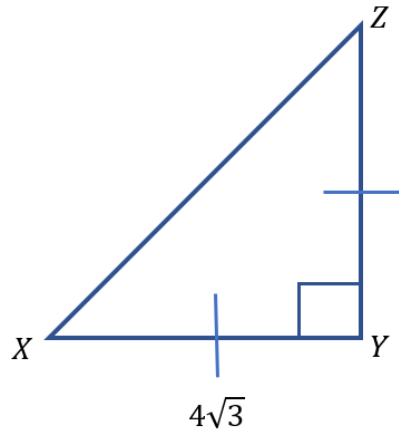
44. A group of 100 people was surveyed. Event A is an adult being chosen at random. Event B is a person who likes chocolate being chosen. Describe the group of people for each expression? The notation ∩ means "intersection," and the notation ∪ means "union."

A) $A \cap B$

B) $A^C \cup B^C$

C) $A^C \cap B^C$

D) $A \cap B^C$

45. You spin the numbered spinner shown below. Event A is landing on an even number. Event B is landing on a multiple of 3 number. What is the intersection of A and B?
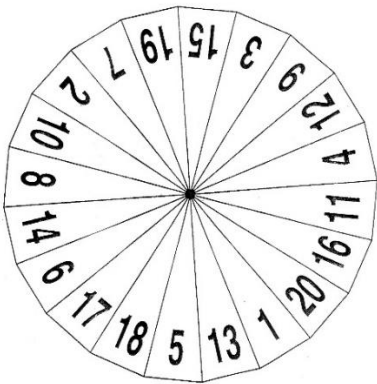
Use the table below to answer 46–47:

	A	Not A	TOTAL
B	15	50	65
Not B	105	30	135
TOTAL	120	80	200

The table shows the outcomes of 120 trials of an experiment.

46. **What is $P(A \cap not\ B)$?**

47. **What is $P(A|B)$?**

48. A jar contains 6 blue marbles, 5 red marbles, and 4 green marbles.

Fred selects a marble from the bag. What is the probability that the marble he picks is red or green?

49. A jar contains 6 blue marbles, 5 red marbles, and 4 green marbles.
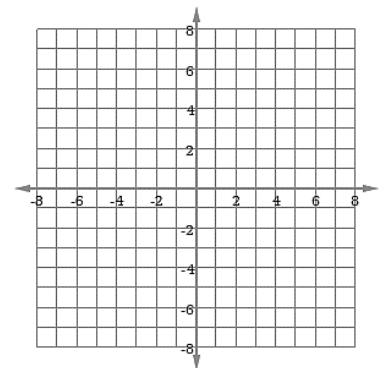
Fred selects a marble from the bag and then keeps it. Jane then selects another marble from the bag. What is the probability that Fred selects a red marble and Jane selects a blue marble?

50. A = { 11, 12,13, 14} and B = {11, 13, 15}

What is $A \cup B$?

51. A = {11, 12, 13, 14} and B = {11, 13, 15}

What is $A \cap B$?

52. What is the most precise name of the shape with the given vertices?

W(0.5, 0), X(3.5, 2.5), Y(1, 5.5), Z(-2, 3)

A) Square

B) Trapezoid

C) Rhombus

D) None of the above

53. What is the most precise name of the shape with the given vertices?

J(-3, 1), K(-1, 3), L(1, 3), M(2, 1)

A) Kite

B) Rhombus

C) Trapezoid

D) Rectangle