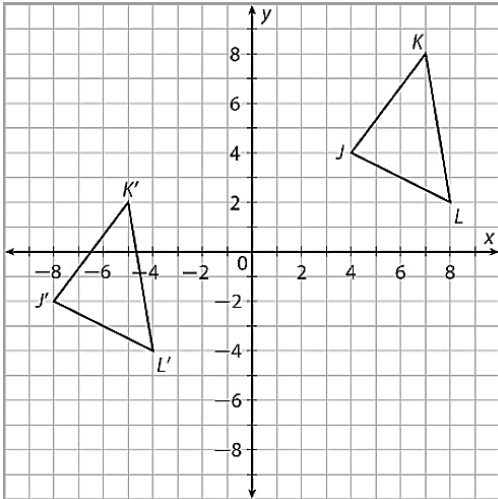


Geometry – Semester 2 Final Exam Review

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

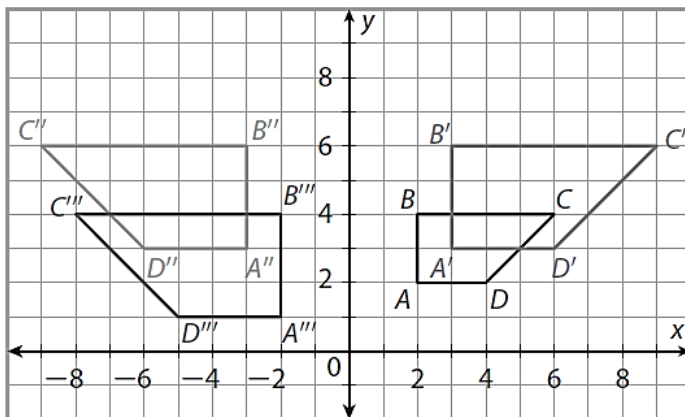
$\sqrt{61}$

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



$\langle -12, -6 \rangle$

Question 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?



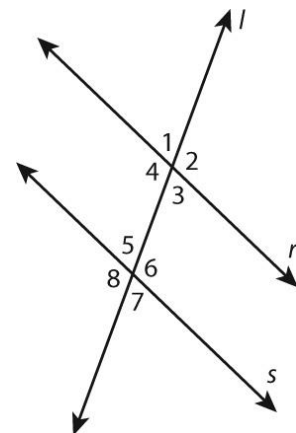
$(1.5x, 1.5y)$

$(-x, y)$

$(x + 1, y - 2)$

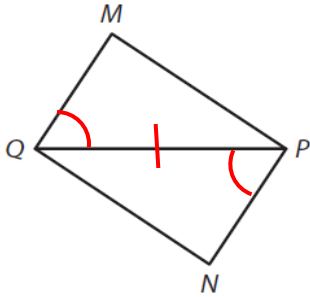
Question 4 – If r is parallel to s , which of these explains why $\angle 2 \cong \angle 6$?

- A vertical angles theorem
- B alternate interior angles theorem
- C corresponding angles theorem**
- D linear pair postulate

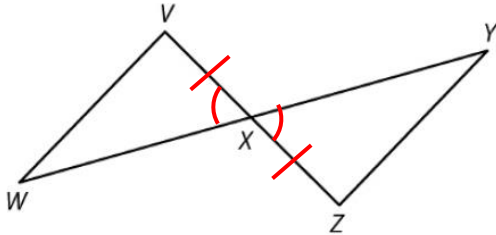


Question 5 – Look at the figure:

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? $\overline{MQ} \cong \overline{NP}$



Question 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.

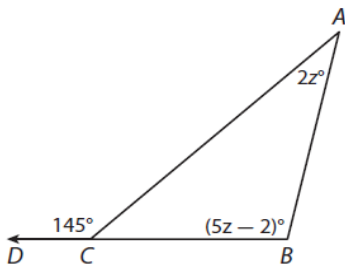


Not enough information. Need either:

$\angle V \cong \angle Z$ or $\overline{WX} \cong \overline{YX}$

(ASA) (SAS)

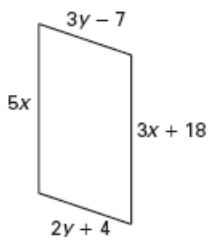
Question 7 – In $\triangle ABC$ what is $\angle B$?



$z = 21$

$\angle B = 5(21) - 2 = 103^\circ$

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



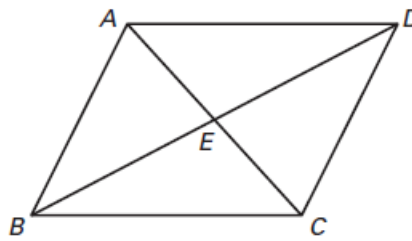
$x = 9$

$y = 11$

Question 9 –

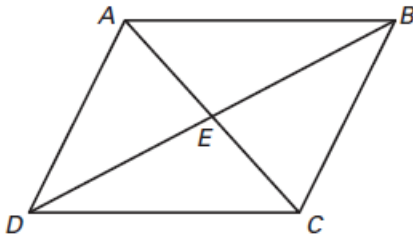
Decide whether each piece of given information alone is sufficient to prove that quadrilateral $ABCD$ is a parallelogram.

- E is the midpoint of \overline{AC} and \overline{BD} . yes
- $m\angle ABC + m\angle BCD = 180^\circ$ no
- $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \cong \overline{DA}$ no
- $\angle ABC \cong \angle ADC$, and $\angle BAD \cong \angle BCD$ yes
- $\triangle ABE \cong \triangle DCE$ no
- $\triangle ABE \cong \triangle CDE$ yes



Question 10 –

Quadrilateral $ABCD$ is a rhombus.



- If $m\angle BAE = 32^\circ$, find $m\angle ECD$. 32°
- If $m\angle EDC = 43^\circ$, find $m\angle CBA$. 43 × 2 = 86°
- If $m\angle EAB = 57^\circ$, find $m\angle ADC$. 180 - 57(2) = 66°
- If $m\angle BEC = 3x - 15^\circ$, solve for x . x = 35
- If $m\angle ADE = 5x - 8^\circ$ and $m\angle CBE = 3x + 24$, solve for x . x = 16
- If $m\angle BAD = 4x + 14^\circ$ and $m\angle ABC = 2x + 10^\circ$, solve for x . x = 26

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

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

Question 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.

$$JL = \sqrt{10}$$

$$KM = \sqrt{10}$$

$$\text{slope of } \overline{JL} = -\frac{3}{1}$$

$$\text{slope of } \overline{KM} = \frac{1}{3}$$

$$\text{midpoint of } \overline{JL} = (4.5, 2.5)$$

$$\text{midpoint of } \overline{KM} = (4.5, 2.5)$$

Question 13 –

Which of the following quadrilaterals have the given property?

All sides are congruent. **C, D** A. Parallelogram

All angles are congruent. **B, D** B. Rectangle

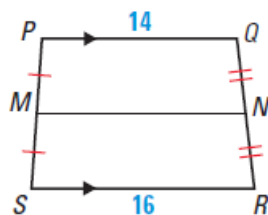
The diagonals are congruent. **B, D** C. Rhombus

Opposite angles are congruent. **A, B, C, D**. Square

Question 14 –

In trapezoid $PQRS$, find MN .

$$MN = 15$$



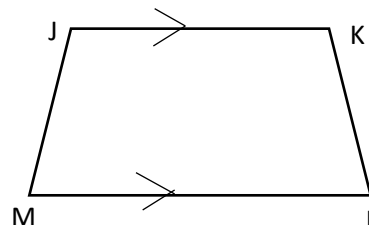
Question 15 –

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

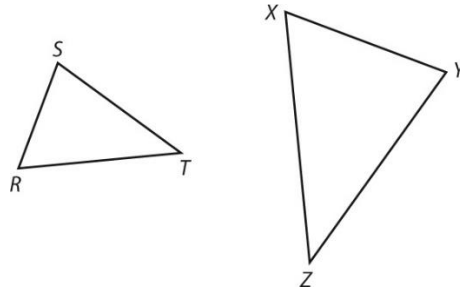
\overline{JK} and \overline{ML} **E** \overline{MJ} and \overline{KL} **F** \overline{ML} and \overline{KL} **B**

$\angle K$ and $\angle M$ **C** \overline{JL} and \overline{KM} **D** $\angle M$ and $\angle L$ **A**

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



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



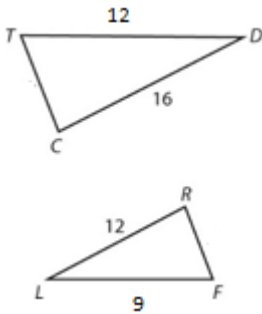
- A $\frac{RS}{RT} = \frac{ST}{YZ}$
- B $\frac{RS}{XZ} = \frac{ST}{XY}$
- C $\frac{RT}{XZ} = \frac{RS}{YZ}$
- D $\frac{RT}{XZ} = \frac{RS}{XY}$

Question 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.



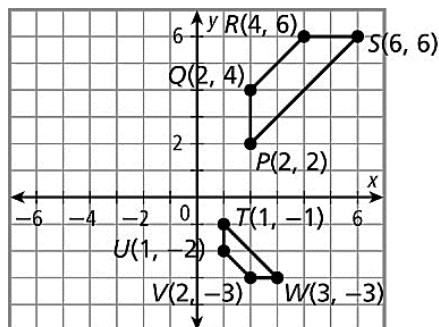
$x = 20$ feet

Question 18 - Name one additional piece of information that is sufficient to prove that the triangles are similar.



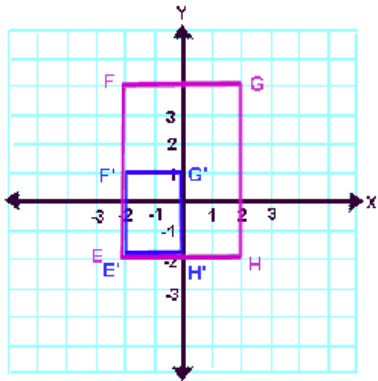
- A $TD \cong FL$
- B $\angle C \cong \angle R$
- C $\angle T \cong \angle F$
- D $\angle D \cong \angle L$

Question 19 - Using coordinate notation, tell what series of transformations will map figure TUVW to the second figure PQRS.



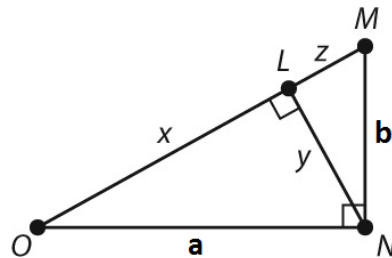
$(x, y) \rightarrow (2x, 2y) \rightarrow (x, -y)$

Question 20 - Rectangle $EFGH$ was dilated to create rectangle $E'F'G'H'$. What is the scale factor of the dilation? $\frac{1}{2}$

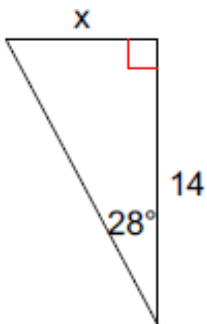


Question 21 - Fill in the blank.

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

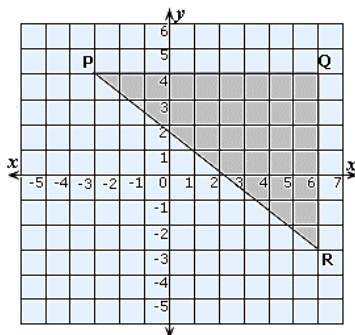


Question 22 - Find the value of x to the nearest tenth.



$$x \approx 7.4$$

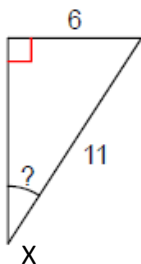
Question 23 - Find the length of the hypotenuse and the measure of Angle R.



$$c = \sqrt{130} \approx 11.4$$

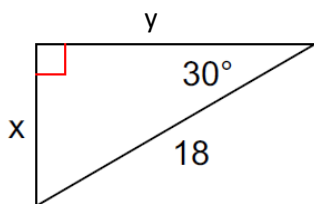
$$m\angle R \approx 52.1^\circ$$

Question 24 - Find the measure of the missing angle.



$$m\angle X \approx 33.1^\circ$$

Question 25 -

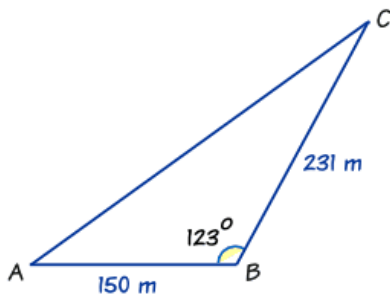


What are the missing side lengths in $\triangle TSU$? Explain. Keep your answer in simplified radical form.

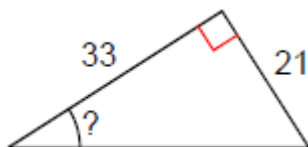
30	60	90
x	$x\sqrt{3}$	2x
9	$9\sqrt{3}$	18
(x)	(y)	

Question 26 - Find the area of triangle ABC

$$A \approx 14530 \text{ m}^2$$

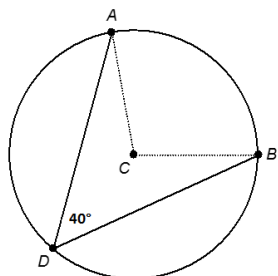


Question 27 - Find the measure of The Angle, Round to the nearest Tenth.



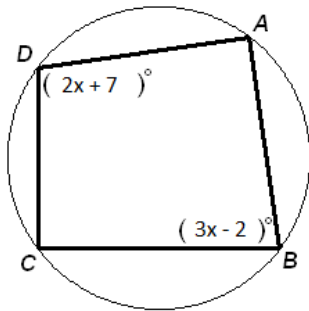
$$x \approx 32.5^\circ$$

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



$$m\angle ACB = 80^\circ$$

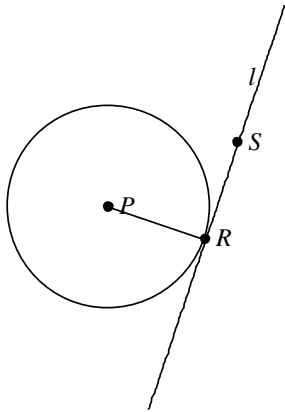
Question 29 – Quadrilateral ABCD is circumscribed by a circle, as shown in the diagram to the right. What is the measure of angle B?



$$x = 35$$

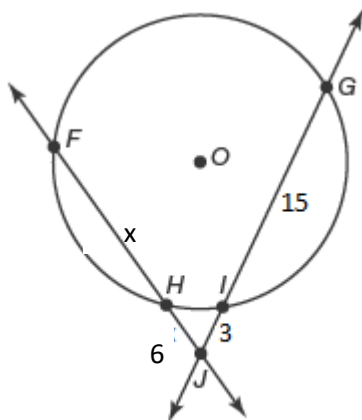
$$m\angle B = 3(35) - 2 = 103^\circ$$

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



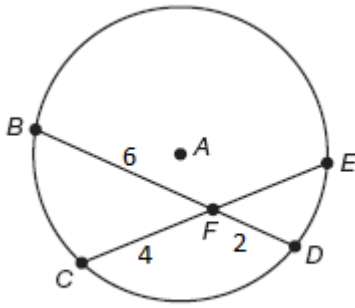
- A) \overline{SR} is the same length as \overline{PR} . **False**
- B) $m\angle PRS = 90^\circ$ **True**
- C) Line l is tangent to circle P at the point of tangency R . **True**
- D) Line l intersects circle P exactly once. **True**
- E) Line l is perpendicular to \overline{PR} **True**

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



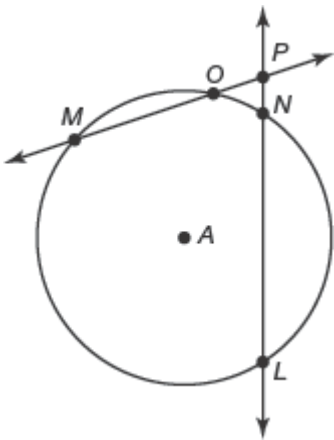
$$x = 3$$

Question 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 FE ?



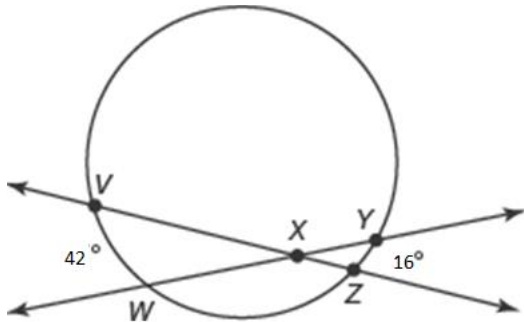
$$x = 3$$

Question 33 – If $m\widehat{ML} = 120^\circ$ and $m\widehat{NO} = 10^\circ$, what is the $m\angle MPL$?



$$55^\circ$$

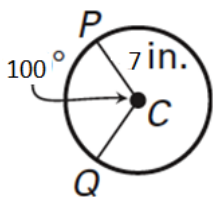
Question 34 – If $m\widehat{WV} = 42^\circ$ and $m\widehat{YZ} = 16^\circ$, what is the measure of $\angle VXW$?



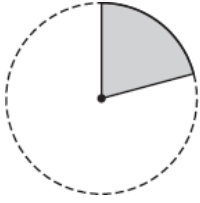
$$= 29^\circ$$

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

$$\approx 12.22 \text{ in}$$



Question 36 – Part of an ancient circular plate was discovered. It was measured to be only an 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?



$$A \approx 8.38 \text{ in}^2$$

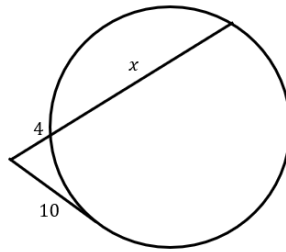
Question 37 – The circular path of cars on a Ferris wheel can be modeled with the equation $x^2 - 12x + y^2 - 100y = -36$, measured in feet. What is the maximum height above ground of the riders?

$$x^2 - 12x + 36 + y^2 - 100y + 2500 = -36 + 36 + 2500$$

$$(x - 6)^2 + (y - 50)^2 = 2500 \quad r = 50 \text{ so diameter} = 100 \text{ maximum height is } 100 \text{ ft}$$

Question 38 – Write the equation of a circle with center $M(-5,3)$ and radius 4. $(x + 5)^2 + (y - 3)^2 = 16$

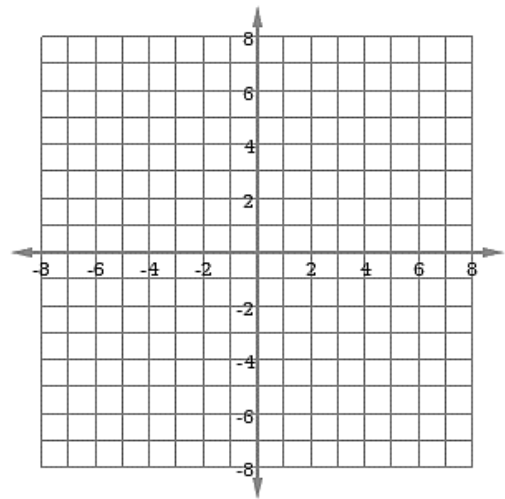
Question 39 – Find x . 21



Question 40 – Find the circumference of a circle with an area of $400\pi \text{ ft}^2$. $40\pi \text{ ft}$

Question 41– Which point lies on the circle that is centered at the origin and contains the point $(0, 7)$?

- A) $(-6, \sqrt{13})$ B) $(-2, \sqrt{3})$ C) $(\sqrt{12}, -1)$ D) $(\sqrt{15}, 5)$



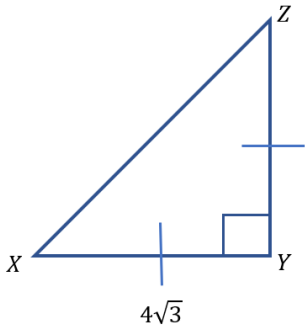
Question 42 – Find the center and radius of the circle by completing the square twice.

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

Center: $(5, -1)$

Radius: 8

Question 43 – Find the length of XZ. Leave your answer in simplest radical form.

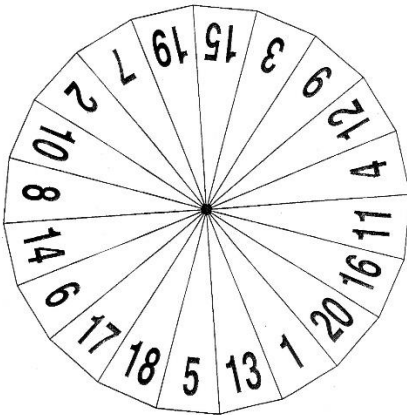


45	45	90
x	x	$x\sqrt{2}$
$4\sqrt{3}$	$4\sqrt{3}$	$4\sqrt{6}$

Question 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 \cap means “intersection,” and the notation \cup means “union.”

- A) $A \cap B$ B) $A^c \cup B^c$ C) $A^c \cap B^c$ D) $A \cap B^c$
 an adult who likes Chocolate all children plus adults who don't like chocolate children who don't like chocolate adults who don't like chocolate

Question 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? $\{6, 12, 18\}$



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.

Question 46 -What is $P(A \cap \text{not } B)$? $\frac{105}{200} = \frac{21}{40} = 52.5\%$

Question 47- What is $P(A|B)$? $\frac{15}{65} = \frac{3}{13} \approx 0.23$

Question 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? $\frac{9}{15} = \frac{3}{5}$

Question 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? $\frac{1}{7}$

Question 50 – $A = \{11, 12, 13, 14\}$ and $B = \{11, 13, 15\}$

What is $A \cup B$? $\{11, 12, 13, 14, 15\}$

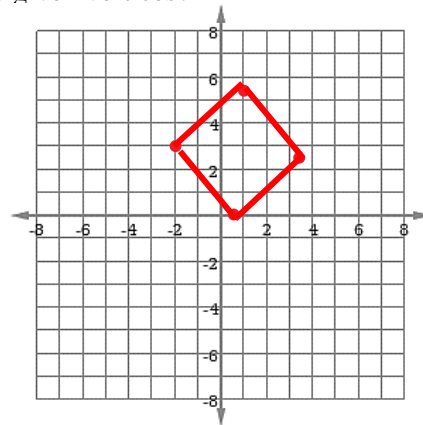
Question 51 – $A = \{11, 12, 13, 14\}$ and $B = \{11, 13, 15\}$

What is $A \cap B$? $\{11, 13\}$

Question 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



Question 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

