

TEST NAME: **Math II Final Review Test**
TEST ID: **3133790**
GRADE: **10 - Tenth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

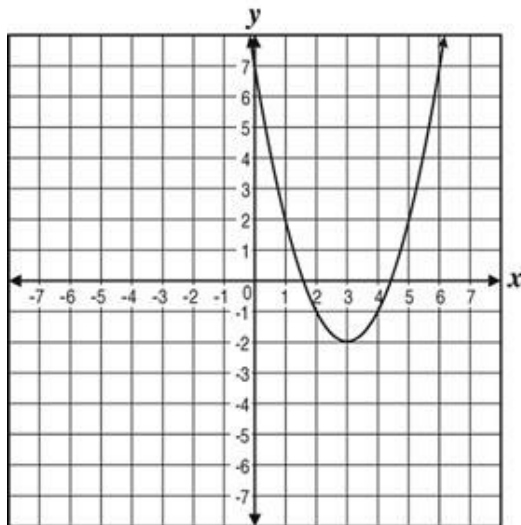
Class: _____

Date: _____

1. Which polynomial is the product of $(5x - 1)(3x^2 + 5x - 7)$?

- A. $15x^3 + 28x^2 - 40x - 7$
- B. $15x^3 + 28x^2 - 40x + 7$
- C. $15x^3 + 22x^2 - 40x - 7$
- D. $15x^3 + 22x^2 - 40x + 7$

2. Which equation represents the quadratic function graphed below?



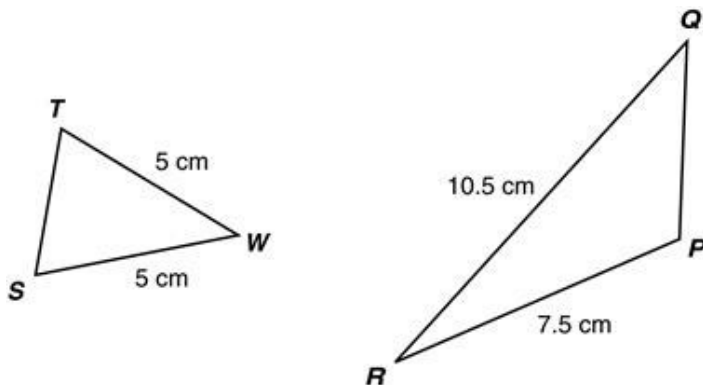
- A. $f(x) = (x - 3)^2 - 2$
- B. $f(x) = (x + 3)^2 - 2$
- C. $f(x) = (x - 3)^2 + 2$
- D. $f(x) = (x + 3)^2 + 2$

3. A jar contains 4 green marbles and 3 blue marbles of the same size and shape. Rachel will randomly pull 2 marbles from the bag at the same time. What is the probability that she will pull 1 green marble and 1 blue marble?

- A. $\frac{1}{12}$
- B. $\frac{2}{7}$
- C. $\frac{7}{24}$
- D. $\frac{4}{7}$

4. A student was given the drawing of the triangles below and was asked to prove $\triangle STW \sim \triangle RQP$.

Given: $\angle W \cong \angle P$



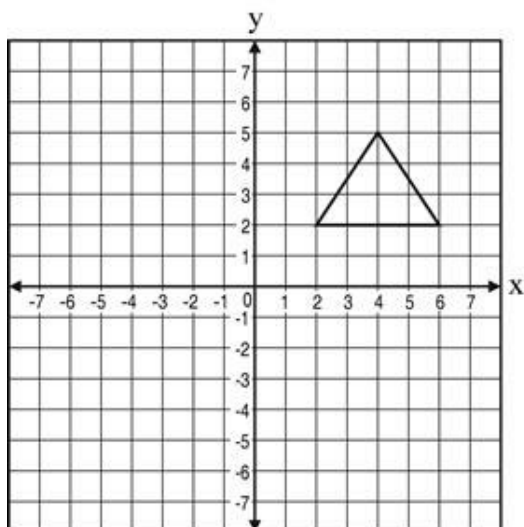
The student's proof is shown below.

<u>Statement</u>	<u>Reason</u>
1. $\angle W \cong \angle P$	1. Given
2. $\frac{TW}{PQ} = \frac{5}{7.5} = \frac{2}{3}$	2. Definition of ratio
3. $\frac{SW}{RP} = \frac{5}{7.5} = \frac{2}{3}$	3. Definition of ratio
4. $\triangle STW \sim \triangle RQP$	4. _____

Which reason is justification for statement 4?

- A. Side-Side Similarity Theorem
 - B. Side-Side-Side Similarity Theorem
 - C. Side-Angle-Side Similarity Theorem
 - D. Angle-Side-Angle Similarity Theorem
5. Which equation has a slope of $-\frac{2}{3}$ and a y-intercept of 5?
- A. $y - 5 = -\frac{2}{3}x$
 - B. $y + 5 = -\frac{2}{3}x$
 - C. $y = -\frac{2}{3}(x - 5)$
 - D. $y = -\frac{2}{3}(x + 5)$

6. The triangle in the graph will be reflected over the x -axis and then over the y -axis.



Which transformation of the triangle would produce the same image?

- A reflection over the line $y = -x$
 - B rotation 180° counterclockwise about the origin
 - C reflection over the y -axis and a translation of 4 units down
 - D rotation 90° clockwise about the origin and a translation of 4 units to the left
7. Lindsay solved the following system and obtained the given solutions.

$$\begin{cases} y = x^2 - 2 \\ y - 4 = x \end{cases}$$

$(-2, 2)$ and $(3, 7)$

Which statement BEST describes the reasonableness of this solution?

- A The solution $(3, 7)$ is not reasonable because $3^2 - 2$ equals 4.
- B Neither solution is reasonable because $\begin{cases} -2 \neq 2^2 - 2 \\ -2 - 4 \neq 2 \end{cases}$ and $\begin{cases} 3 \neq 7^2 - 2 \\ 3 - 4 \neq 7 \end{cases}$.
- C Both solutions are reasonable because the line will intersect the parabola at the given solutions.
- D Both solutions are reasonable because there are an infinite number of solutions since the domain of both equations is all real numbers.

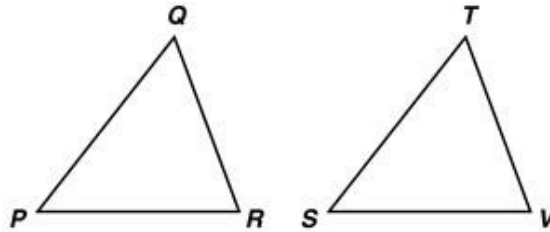
8. Jeremy was proving the following theorem:

If two angles of one triangle are congruent to two angles of a second triangle, then the third angles of the triangles are congruent.

Jeremy's proof is shown below.

Given: $\angle Q \cong \angle T$
 $\angle P \cong \angle S$

Prove: $\angle R \cong \angle V$



Statements	Reasons
1. $\angle Q \cong \angle T$ $\angle P \cong \angle S$	1. Given
2. $m\angle Q = m\angle T$ $m\angle P = m\angle S$	2. Definition of Congruency
3. $m\angle P + m\angle Q + m\angle R = 180^\circ$ $m\angle S + m\angle T + m\angle V = 180^\circ$	3. Triangle Sum Theorem
4. $m\angle P + m\angle Q + m\angle R = m\angle S + m\angle T + m\angle V$	4. Transitive Property of Equality
5. ?	5. Substitution Property
6. $m\angle R = m\angle V$	6. Subtraction Property of Equality
7. $\angle R \cong \angle V$	7. Definition of Congruency

Which statement BEST represents Step 5 of Jeremy's proof?

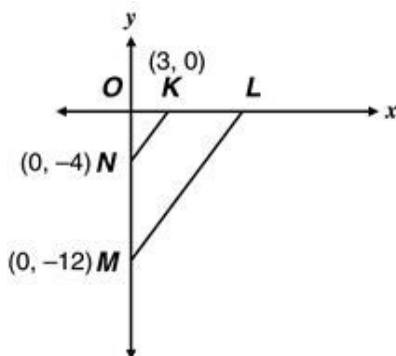
- A. $180^\circ = 180^\circ$
- B. $180^\circ - m\angle R = 180^\circ - m\angle V$
- C. $m\angle P + m\angle Q = m\angle T + m\angle S$
- D. $m\angle P + m\angle Q + m\angle R = m\angle P + m\angle Q + m\angle V$

9. Analyze the given graph, which models the number of hours (h) to complete a 12-hour job as being inversely proportional to the number of people (p) doing the job.



Which equation could be used to represent the information in this graph?

- A. $12h = p$
 - B. $h = 12p$
 - C. $ph = 12$
 - D. $p + h = 12$
10. $\triangle KON$ is dilated with a scale factor of 3 to form $\triangle LOM$.



What are the coordinates of Point L ?

- A. (1, 0)
- B. (6, 0)
- C. (9, 0)
- D. (12, 0)

11. Which expression is equivalent to $(6 \sqrt[5]{3x})(2 \sqrt[5]{6x^2})(3 \sqrt[5]{3x})$?

- A. $11 \sqrt[5]{12x^4}$
- B. $11 \sqrt[5]{54x^4}$
- C. $36 \sqrt[5]{12x^4}$
- D. $36 \sqrt[5]{54x^4}$

12. Which expression is equivalent to $\frac{\sqrt[3]{40x^3}}{\sqrt[3]{125xy^6}}$?

- A. $\frac{2x^2 \sqrt[3]{2}}{5y^3}$
- B. $\frac{2x \sqrt[3]{x}}{y^2}$
- C. $\frac{2x \sqrt[3]{x}}{5y^3}$
- D. $\frac{2x \sqrt[3]{5x}}{5y^2}$

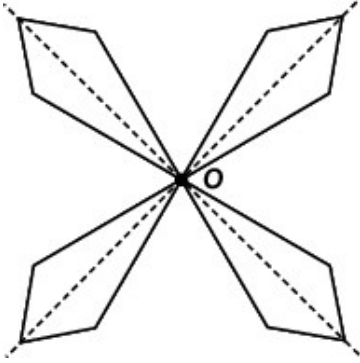
13. Which of the following mathematical sentences is true?

- A. $\sqrt{4x} = 4 \left(x^{\frac{1}{2}} \right)$
- B. $\frac{1}{9^{\frac{1}{2}}} = 4.5$
- C. $\sqrt[3]{27} = 3$
- D. $y^{-\frac{1}{2}} = \sqrt{y}$

14. A regular hexagon is rotated on a coordinate plane. Which rotation would result in a hexagon with vertices at the same coordinates as the vertices of the original hexagon?

- A. a 60° clockwise rotation about the center of the hexagon
- B. a 90° clockwise rotation about the center of the hexagon
- C. a 60° clockwise rotation about one of the vertices of the hexagon
- D. a 90° clockwise rotation about one of the vertices of the hexagon

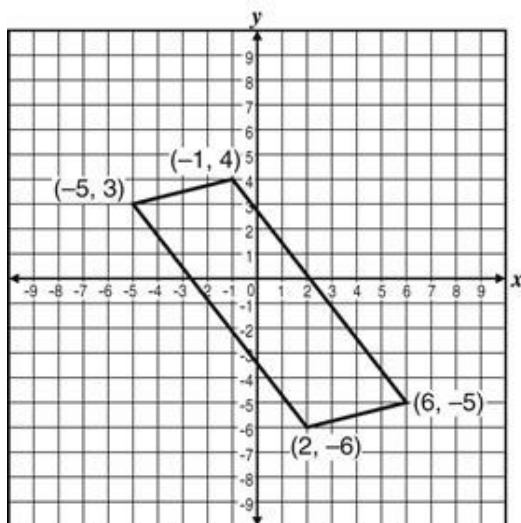
15. Mr. Williams drew the image of a windmill with the perpendicular lines of symmetry shown below.



He asked two of his students what rotation about the center point, O , will result in an image that looks like the original. Lara said 90° clockwise and Clark said 180° . Which student(s) answered correctly?

- A. only Lara
- B. only Clark
- C. both Lara and Clark
- D. neither Lara nor Clark

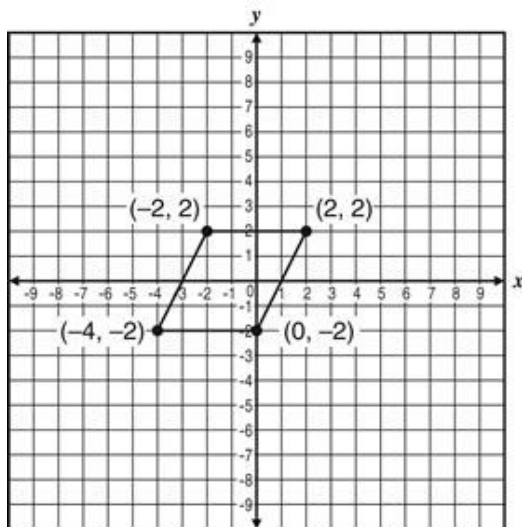
16. The parallelogram below will be rotated 90° clockwise about the origin.



Which coordinates correspond to one vertex of the rotated parallelogram?

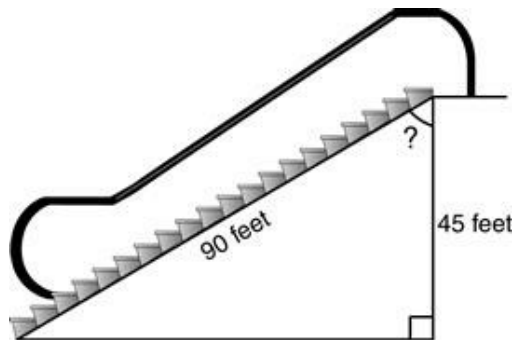
- A. $(-6, -2)$
- B. $(-3, -5)$
- C. $(1, -4)$
- D. $(6, 5)$

17. Which transformation of the parallelogram below will NOT change the coordinates of its vertices?



- A. reflection over the x -axis
- B. reflection over the y -axis
- C. rotation of 90 degrees about its center
- D. rotation of 180 degrees about its center

18. A 90-foot escalator rises a vertical distance of 45 feet, as shown in the diagram below.



What is the measure of the angle identified with a question mark in the diagram?

- A. 30°
 - B. 45°
 - C. 60°
 - D. 90°
19. Consider the expression $(3j - 5)[3(2j + 7) - 4k(6j - 8)]$.

Which expression represents a factor of the given expression?

- A. $(2j + 7)$
- B. $(6j - 8)$
- C. $(3 - 4k)$
- D. $(3j - 5)$

20. A hotel has the following vacant rooms:

- 2 on Floor 1
- 8 on Floor 2
- 10 on Floor 3
- 5 on Floor 4

All the vacant rooms are identical. The next hotel guest will be assigned one of these vacant rooms at random. Which table shows $P(x)$, the probability that the assigned room will be on Floor x ?

A.

x	$P(x)$
1	0.08
2	0.32
3	0.50
4	0.10

B.

x	$P(x)$
1	0.08
2	0.32
3	0.40
4	0.20

C.

x	$P(x)$
1	0.10
2	0.32
3	0.40
4	0.18

D.

x	$P(x)$
1	0.1
2	0.3
3	0.4
4	0.2

21. What is the range of the function $y = \sqrt{\frac{x}{5}}$ over the domain $5 \leq x \leq 25$?

- A. $1 \leq y \leq \sqrt{5}$
- B. $1 \leq y \leq 5$
- C. $\sqrt{5} \leq y \leq 5$
- D. $5 \leq y \leq 25$

22. Triangle ABC is rotated 90 degrees counterclockwise and then translated 3 units up to form Triangle $A'B'C'$. Which transformation can be used to map each point (x, y) on Triangle ABC to its corresponding point on Triangle $A'B'C'$?

- A. $(x, y) \rightarrow (y + 3, -x)$
- B. $(x, y) \rightarrow (y, -x + 3)$
- C. $(x, y) \rightarrow (-y + 3, x)$
- D. $(x, y) \rightarrow (-y, x + 3)$

23. Two transformations of Quadrilateral $PQRS$ are described below.

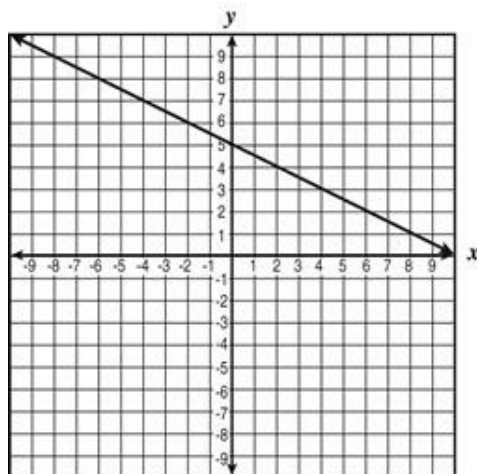
• First transformation: $(x, y) \rightarrow (x + 1, y - 2)$

• Second transformation: $(x + 1, y - 2) \rightarrow (x + 1, 2 - y)$

Which transformations were used on Quadrilateral $PQRS$?

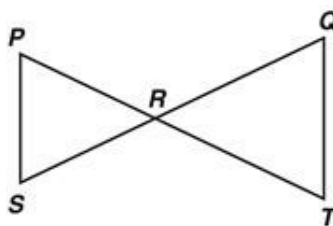
- A. a reflection over the x -axis, then a translation
- B. a reflection over the y -axis, then a translation
- C. a translation, then a reflection over the x -axis
- D. a translation, then a reflection over the y -axis

24. The graph below shows $y = 5 - \frac{1}{2}x$.



Rena reflected this graph over the x -axis. Which of the following equations represents her graph?

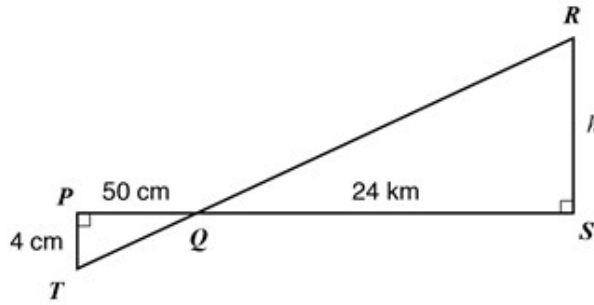
- A. $y = \frac{1}{2}x$
 B. $y = \frac{1}{2}x + 5$
 C. $y = \frac{1}{2}x - 5$
 D. $y = -\frac{1}{2}x - 5$
25. In the figure below, \overline{PS} is parallel to \overline{QT} . Points P , R , and T are collinear and Points S , R , and Q are collinear.



Which statement must be true?

- A. $\triangle PRS \sim \triangle RQT$
 B. $\triangle PRS \sim \triangle TRQ$
 C. $\triangle PRS \cong \triangle RQT$
 D. $\triangle PRS \cong \triangle TRQ$

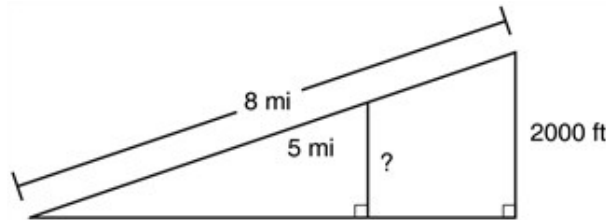
26. Julia used a telescope to look at a cliff 24 kilometers away. The diagram shows that the image height of the cliff measures 4 centimeters at an image distance of 50 centimeters. In the diagram, $\overline{PT} \parallel \overline{RS}$.



Note: Figure is not drawn to scale.

What is the height (h) of the cliff in kilometers?

- A. 2.08
 - B. 1.92
 - C. 0.52
 - D. 0.48
27. A road starts at sea level and climbs steadily, reaching an elevation of 2000 feet after 8 miles, as shown in the diagram.



Note: Figure is not drawn to scale.

What is the elevation in feet of the road 5 miles from the starting point?

- A. 750
- B. 1000
- C. 1250
- D. 1500

28. Anna made and sold x ceramic vases one week. Her profit, P , in dollars, is calculated using the formula $P = R - C$, where R represents her revenue and C represents her costs. If $R = 25x - 0.5x^2$ and $C = 100 + 5x$, which expression represents her profit, in dollars?
- A. $-0.5x^2 + 20x - 100$
 B. $-0.5x^2 + 30x - 100$
 C. $0.5x^2 - 20x + 100$
 D. $0.5x^2 + 30x + 100$
29. Which polynomial is equivalent to $6b^2(5b^3 - 10b^2 + 8)$?
- A. $30b^5 - 60b^4 + 48b^2$
 B. $30b^5 - 60b^4 + 48$
 C. $30b^6 - 60b^4 + 48b^2$
 D. $30b^6 - 60b^4 + 48$
30. On her drive to school each day, Mia comes to three traffic lights. The table shows the probability that each traffic light is green, yellow, or red when she gets to it.

Traffic Light Probabilities

Traffic Light	Probability of Green	Probability of Yellow	Probability of Red
1	0.75	0.05	0.2
2	0.35	0.05	0.6
3	0.45	0.05	0.5

Assume that the probabilities at each traffic light are independent. What is the probability that all three traffic lights will be either green or yellow when Mia gets to them?

- A. 0.000015
 B. 0.11825
 C. 0.16
 D. 0.94
31. The graph of a function crosses the x -axis at -6 and 2 and crosses the y -axis at 12 . Which equation could the graph represent?
- A. $y = x^2 + 4x - 12$
 B. $y = x^2 - 4x - 12$
 C. $y = -x^2 - 4x + 12$
 D. $y = -x^2 + 4x + 12$

32. Which situation could be BEST represented by the function $f(x) = ax^2 + bx + c$ for $a < 0$?

- A. the price of a gallon of regular unleaded gasoline in the United States
- B. the number of daily newspapers sold from the year 2003 to the present
- C. the hourly high temperature in Chicago, Illinois, from 6:00 a.m. to 10 p.m.
- D. the number of weekday customers at a restaurant from 11:00 a.m. to 7:00 p.m.

33. The figure below is a parallelogram with two horizontal sides. The figure is not a rhombus, a rectangle, nor a square.



How many lines of symmetry does this figure possess?

- A. 0
- B. 2
- C. 4
- D. 5

34. Which equation represents the following quadratic function in standard form?

$$f(x) = -(x - 4)^2 + 3$$

- A. $f(x) = -x^2 - 13$
- B. $f(x) = x^2 - 8x + 19$
- C. $f(x) = -x^2 + 8x - 13$
- D. $f(x) = -x^2 + 8x - 19$

35. The table below shows pairs of values for a functional relationship between a and b .

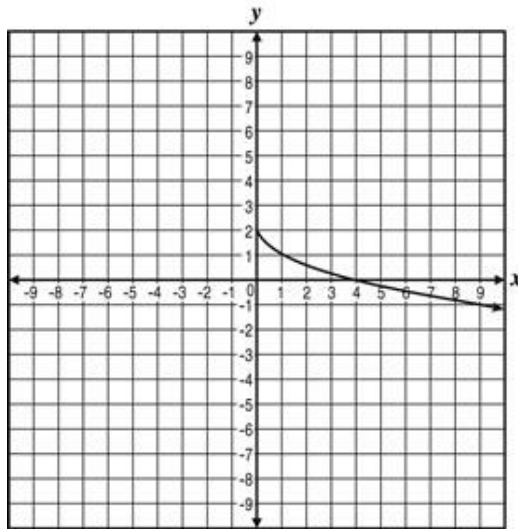
**Relationship Between
 a and b**

Variable a	Variable b
4	6
9	12
25	30

Which equation is true for all pairs of values in the table?

- A. $b = 4\sqrt{a}$
- B. $b = 6\sqrt{a}$
- C. $b = 2a - \sqrt{a}$
- D. $b = a + \sqrt{a}$

36. The following is the graph of $y = -\sqrt{x} + 2$.



What is the value of x when $y = 0$?

- A. 2
- B. 3
- C. 4
- D. 6

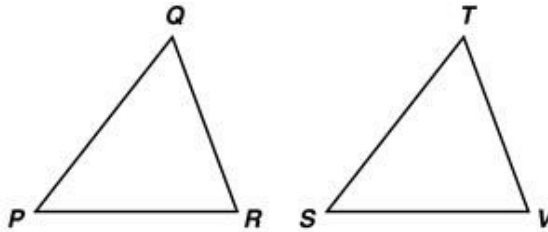
37. Jeremy was proving the following theorem:

If two angles of one triangle are congruent to two angles of a second triangle, then the third angles of the triangles are congruent.

Jeremy's proof is shown below.

Given: $\angle Q \cong \angle T$
 $\angle P \cong \angle S$

Prove: $\angle R \cong \angle V$

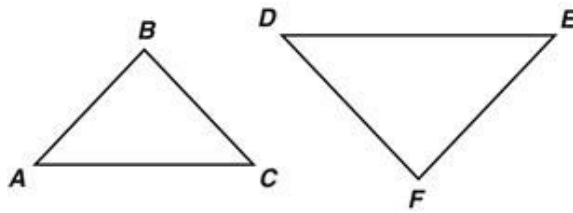


Statements	Reasons
1. $\angle Q \cong \angle T$ $\angle P \cong \angle S$	1. Given
2. $m\angle Q = m\angle T$ $m\angle P = m\angle S$	2. Definition of Congruency
3. $m\angle P + m\angle Q + m\angle R = 180^\circ$ $m\angle S + m\angle T + m\angle V = 180^\circ$	3. Triangle Sum Theorem
4. $m\angle P + m\angle Q + m\angle R = m\angle S + m\angle T + m\angle V$	4. Transitive Property of Equality
5. ?	5. Substitution Property
6. $m\angle R = m\angle V$	6. Subtraction Property of Equality
7. $\angle R \cong \angle V$	7. Definition of Congruency

Which statement BEST represents Step 5 of Jeremy's proof?

- A. $180^\circ = 180^\circ$
- B. $180^\circ - m\angle R = 180^\circ - m\angle V$
- C. $m\angle P + m\angle Q = m\angle T + m\angle S$
- D. $m\angle P + m\angle Q + m\angle R = m\angle P + m\angle Q + m\angle V$

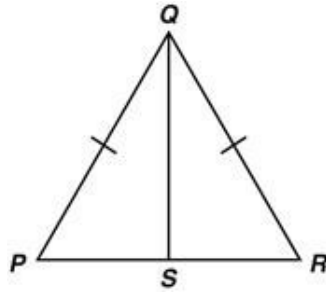
38. In the triangles below, $\frac{AC}{ED} = \frac{BC}{FD}$ and $\angle B \cong \angle F$.



Which statement must be true?

- A. $\overline{AC} \cong \overline{DE}$
- B. $\overline{AB} \cong \overline{EF}$
- C. $\triangle ABC \sim \triangle EFD$
- D. $\triangle ABC \cong \triangle EFD$

39. Manuel is trying to prove the following theorem. If two sides of a triangle are congruent, then the angles opposite these sides are congruent. First Manuel draws isosceles $\triangle PQR$, and then he adds an auxiliary line that bisects $\angle PQR$.



An incomplete version of Manuel's proof is shown below.

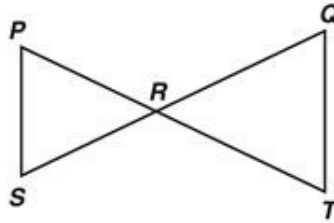
Proof

Statements	Reasons
1. $PQ = RQ$	1. Given
2. $m\angle PQS = m\angle RQS$	2. \overline{QS} bisects $\angle PQR$
3. $QS = QS$	3. Reflexive Property
4. ?	4.
5. $m\angle QPS = m\angle QRS$	5.

What should be the statement for Step 4 of Manuel's proof?

- A. $\angle PQR$ is a right angle
- B. $\triangle PQS \cong \triangle RQS$
- C. $\angle PSQ \cong \angle RSQ$
- D. $\overline{PS} \cong \overline{SR}$

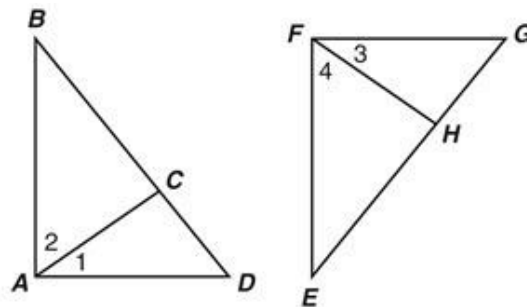
40. In the figure below, \overline{PS} is parallel to \overline{QT} . Points $P, R,$ and T are collinear and Points $S, R,$ and Q are collinear.



Which statement must be true?

- A. $\triangle PRS \sim \triangle RQT$
 - B. $\triangle PRS \sim \triangle TRQ$
 - C. $\triangle PRS \cong \triangle RQT$
 - D. $\triangle PRS \cong \triangle TRQ$
41. Mandy was working on this proof:

In these figures, $\overline{AB} \perp \overline{AD}, \overline{EF} \perp \overline{FG}$, and $\angle 1 \cong \angle 3$.



Prove: $\angle 2 \cong \angle 4$

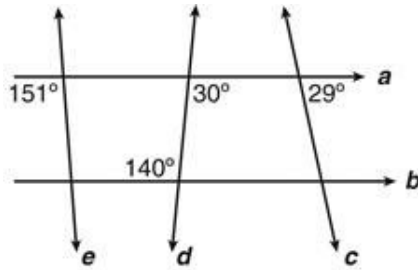
Proof:

Statements	Reasons
1. $\overline{AB} \perp \overline{AD}, \overline{EF} \perp \overline{FG}$, and $\angle 1 \cong \angle 3$	1. Given
2. $m\angle 1 + m\angle 2 = 90^\circ, m\angle 3 + m\angle 4 = 90^\circ$	2. Definition of perpendicularity
3. $\angle 1$ is complementary to $\angle 2$ $\angle 3$ is complementary to $\angle 4$	3. Two angles that form a 90° angle are complementary to each other.
4. $\angle 2 \cong \angle 4$	4. ?

What is the missing statement for the last step of Mandy's proof?

- A. Definition of perpendicular lines
- B. The transitive property of equality
- C. If 2 angles are congruent to equal angles, then the 2 angles are congruent.
- D. If 2 angles are complementary to congruent angles, then the 2 angles are congruent.

42. In this figure, lines a , b , c , d , and e intersect as shown.

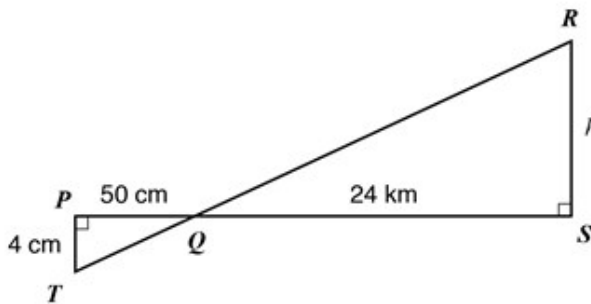


Note: The figure is not drawn to scale.

Based on the angle measures, which pair of lines is parallel?

- A. a and b
- B. c and e
- C. c and d
- D. d and e

43. Julia used a telescope to look at a cliff 24 kilometers away. The diagram shows that the image height of the cliff measures 4 centimeters at an image distance of 50 centimeters. In the diagram, $\overline{PT} \parallel \overline{RS}$.

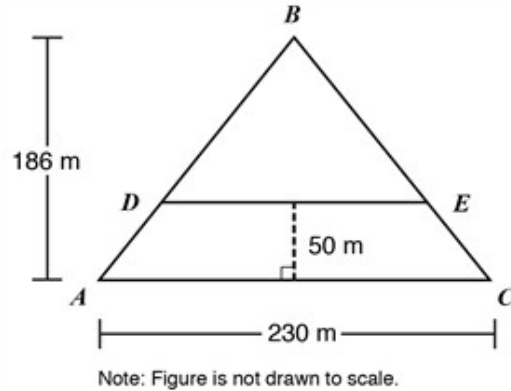


Note: Figure is not drawn to scale.

What is the height (h) of the cliff in kilometers?

- A. 2.08
- B. 1.92
- C. 0.52
- D. 0.48

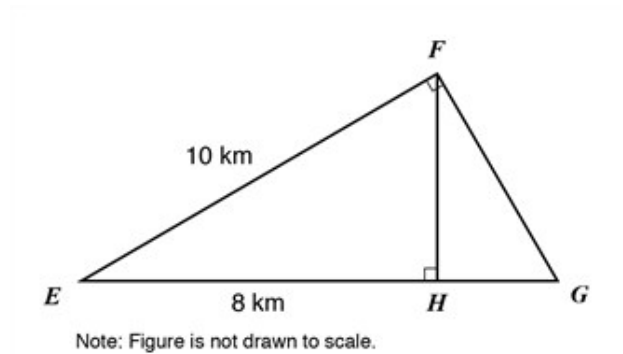
44. Each face of the Great Pyramid of Giza was originally an isosceles triangle with base 230 meters and height 186 meters, as shown below.



In the diagram, \overline{DE} represents a line on the face of the pyramid parallel to AC , such that the distance from \overline{DE} to AC is 50 meters. To the nearest meter, what is the length of \overline{DE} ?

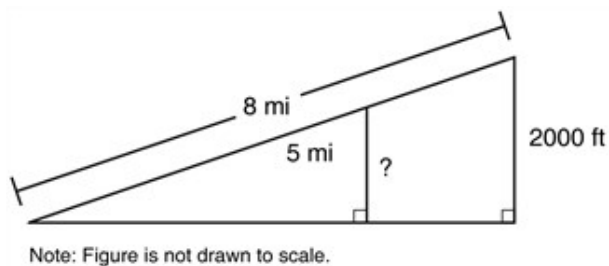
- A. 130
B. 168
C. 180
D. 186
45. A bag contains 5 red marbles, 4 blue marbles, and 3 green marbles. Joshua will select a marble at random, record its color, and then put the marble back in the bag. He will select three marbles in this way. What is the probability that Joshua will first get a red marble, then a blue marble, and then a green marble?
- A. $\frac{1}{60}$
B. $\frac{5}{144}$
C. $\frac{5}{12}$
D. $\frac{47}{60}$

46. The diagram shows a cross-section of a mountain. In the diagram, \overline{FH} is the altitude to the hypotenuse of $\triangle EFG$.



Based on the labeled measurements what is the length in kilometers of \overline{GH} ?

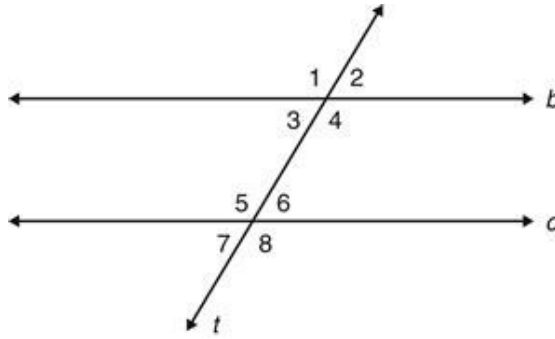
- A. 4.0
 - B. 4.5
 - C. 6.0
 - D. 12.5
47. A road starts at sea level and climbs steadily, reaching an elevation of 2000 feet after 8 miles, as shown in the diagram.



What is the elevation in feet of the road 5 miles from the starting point?

- A. 750
- B. 1000
- C. 1250
- D. 1500

48. In the diagram, parallel lines b and c are cut by transversal t . The informal proof below the diagram lists the reasons needed to justify $\angle 1 \cong \angle 8$.



1. $\angle 1 \cong \angle 4$ since vertical angles are congruent.
2. $\angle 4 \cong \angle 5$ since _____.
3. $\angle 5 \cong \angle 8$ since vertical angles are congruent.
4. $\angle 1 \cong \angle 8$ due to the transitive property of equality.

Which of the following is an acceptable justification for Statement 2?

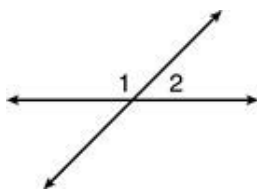
- A. vertical angles are congruent
- B. corresponding angles are congruent
- C. remote interior angles are congruent
- D. alternate interior angles are congruent

49. Which counterexample can be used to show that the following conjecture is FALSE?

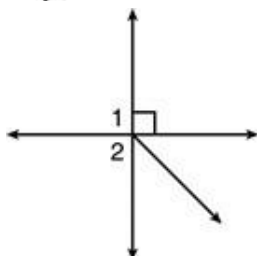
Given: $\angle 1$ and $\angle 2$ are adjacent angles.

Conjecture: $\angle 1$ and $\angle 2$ are supplementary angles.

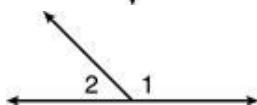
A.



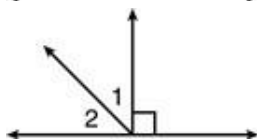
B.



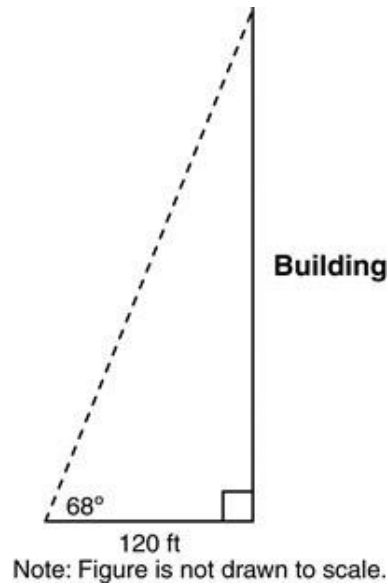
C.



D.



50. From a point at ground level 120 feet from the base of a building, the angle of elevation of the top of the building is 68° .



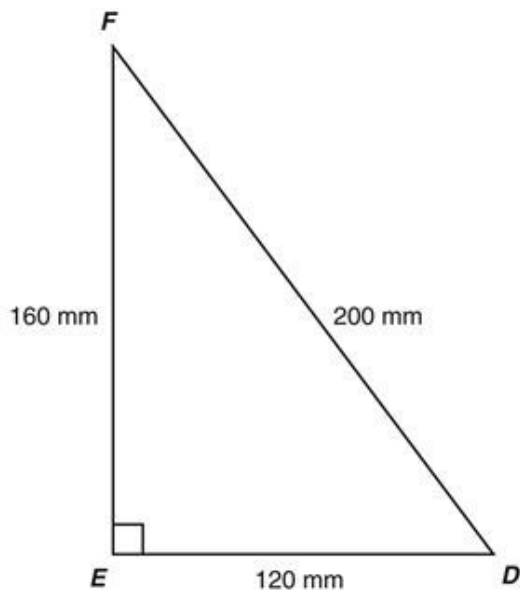
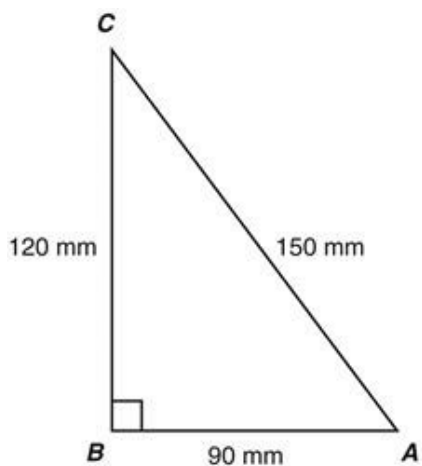
What is the height, to the nearest foot, of the building?

- A. 111
 - B. 297
 - C. 320
 - D. 371
51. What are the solutions of the equation below?

$$x^2 + 5x + 7 = 0$$

- A. $\frac{-5 \pm i\sqrt{3}}{2}$
 - B. $\frac{-5 \pm \sqrt{3}}{2}$
 - C. $-5 \pm i\sqrt{3}$
 - D. $-5 \pm \sqrt{3}$
52. What is the range of the function $y = 4\sqrt{\frac{x}{3}}$ given the domain $0 \leq x \leq 27$?
- A. $0 \leq y \leq 4\sqrt{3}$
 - B. $0 \leq y \leq 12$
 - C. $0 \leq y \leq 12\sqrt{3}$
 - D. $0 \leq y \leq 36$

53. In $\triangle ABC$ and $\triangle DEF$ below, the side lengths are given in millimeters.



Which statement explains why $\triangle ABC$ and $\triangle DEF$ are similar?

- A. Sides BC and DE are congruent.
 B. Corresponding sides are congruent.
 C. Corresponding sides are proportional.
 D. Angles ABC and DEF are right angles.
54. What are the two roots of $9x^2 - 12x + 7 = 0$?
- A. $\frac{2 + \sqrt{3}}{3}, \frac{2 - \sqrt{3}}{3}$
 B. $\frac{2 + \sqrt{11}}{3}, \frac{2 - \sqrt{11}}{3}$
 C. $\frac{2}{3} + \frac{\sqrt{3}}{3}i, \frac{2}{3} - \frac{\sqrt{3}}{3}i$
 D. $\frac{2}{3} + \frac{\sqrt{11}}{3}i, \frac{2}{3} - \frac{\sqrt{11}}{3}i$

55. Which expression is equivalent to $\frac{\sqrt[3]{32}}{\sqrt[3]{2}}$?

- A. $\sqrt[3]{4}$
 B. $2\sqrt[3]{2}$
 C. $4\sqrt[3]{2}$
 D. $8\sqrt[3]{2}$

56. The number of possible string sections (s) to be cut from a 4-inch piece of string varies inversely with the length (l) of each of these string sections. Which equation models this relationship?

A. $s = \frac{l}{4}$

B. $s = \frac{4}{l}$

C. $s = 4l$

D. $s + l = 4$

57. What are the solutions to $x^2 = 8x - 41$?

A. $4 + 2i\sqrt{57}, 4 - 2i\sqrt{57}$

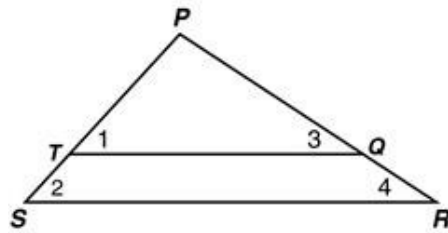
B. $-4 + 5i, -4 - 5i$

C. $4 + 5i, 4 - 5i$

D. $-1, 9$

58. The statements of a proof are shown below.

Given: $\triangle PRS$; $TQ \parallel SR$



Prove: $TS \cdot PQ = PT \cdot QR$

Statements
1. $\triangle PRS$; $\overline{TQ} \parallel \overline{SR}$
2. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$
3. $\triangle PSR \sim \triangle PTQ$
4. $\frac{PS}{PT} = \frac{PR}{PQ}$
5. $\frac{PT+TS}{PT} = \frac{PQ+QR}{PQ}$
6. $1 + \frac{TS}{PT} = 1 + \frac{QR}{PQ}$
7. $\frac{TS}{PT} = \frac{QR}{PQ}$
8. $TS \cdot PQ = PT \cdot QR$

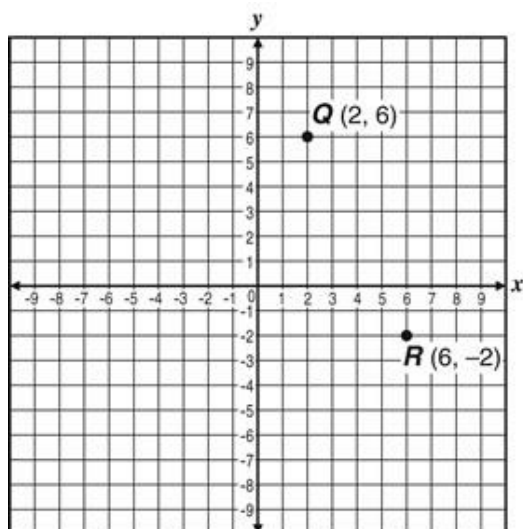
Which statement is justified by the reason “corresponding sides of similar triangles are proportional”?

- A. Statement 3
- B. Statement 4
- C. Statement 5
- D. Statement 7

59. What are the two solutions to $x^2 - 10x + 61 = 0$?

- A. $-1, 11$
- B. $5 + \sqrt{86}, 5 - \sqrt{86}$
- C. $5 + 6i, 5 - 6i$
- D. $5 + i\sqrt{86}, 5 - i\sqrt{86}$

60. When Point Q is rotated 90° counterclockwise about Point P , the result is Point R .



What are the coordinates of Point P ?

- A. $(0, 0)$
B. $(4, 2)$
C. $(6, 6)$
D. $(8, 4)$
61. Triangle ABC is rotated 90 degrees counterclockwise and then translated 3 units up to form Triangle $A'B'C'$. Which transformation can be used to map each point (x, y) on Triangle ABC to its corresponding point on Triangle $A'B'C'$?
- A. $(x, y) \rightarrow (y + 3, -x)$
B. $(x, y) \rightarrow (y, -x + 3)$
C. $(x, y) \rightarrow (-y + 3, x)$
D. $(x, y) \rightarrow (-y, x + 3)$
62. Which expression is a solution to the equation shown?

$$4x^2 = 8x - 9$$

- A. $\frac{-2 + i\sqrt{5}}{2}$
B. $\frac{2 - i\sqrt{5}}{2}$
C. $\frac{2 - i\sqrt{13}}{2}$
D. $\frac{2 + \sqrt{13}}{2}$

63. Two transformations of Quadrilateral $PQRS$ are described below.

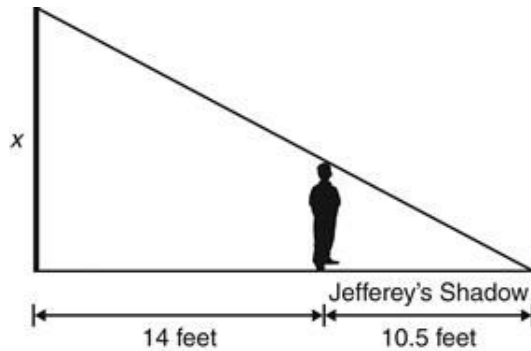
• First transformation: $(x,y) \rightarrow (x+1,y-2)$

• Second transformation: $(x+1, y-2) \rightarrow (x+1, 2-y)$

Which transformations were used on Quadrilateral $PQRS$?

- A. a reflection over the x -axis, then a translation
- B. a reflection over the y -axis, then a translation
- C. a translation, then a reflection over the x -axis
- D. a translation, then a reflection over the y -axis

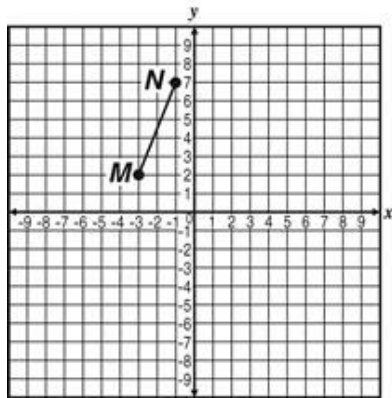
64. To find the height of a utility pole, x , Jefferey walked a distance of 14 feet from the base of the pole until the shadow of the top of his head coincided with the shadow of the top of the pole, as shown below.



If Jefferey is 5 feet 8 inches tall, which is closest to x , the height of the utility pole?

- A. 44.35 feet
- B. 13.53 feet
- C. 13.22 feet
- D. 7.55 feet

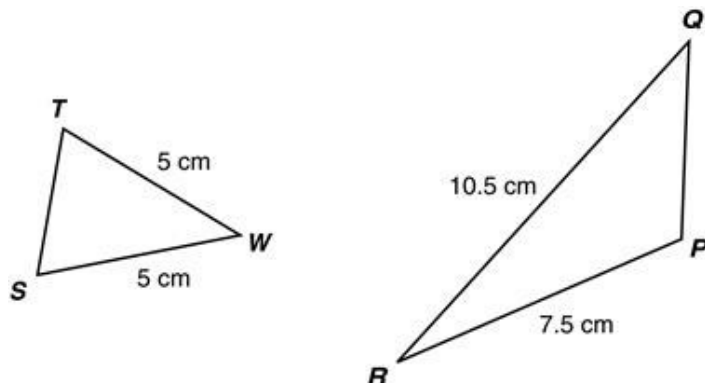
65. \overline{MN} has endpoints at $M(-3, 2)$ and $N(-1, 7)$. If \overline{MN} is reflected over the y -axis, what will the coordinates of the endpoints of the image $\overline{M'N'}$ be?



- A. $M'(3, 2)$ $N'(5, 7)$
B. $M'(-3, -2)$ $N'(-1, 3)$
C. $M'(-3, -2)$ $N'(-1, -7)$
D. $M'(3, 2)$ $N'(1, 7)$
66. In the coordinate plane, which transformation does the function $T(x, y) \rightarrow T(-y, -x)$ represent?
- A. reflection about the line $y = x$
B. reflection about the line $x + y = 0$
C. 180° rotation about the origin
D. 90° counterclockwise rotation about the origin

67. A student was given the drawing of the triangles below and was asked to prove $\triangle STW \sim \triangle RQP$.

Given: $\angle W \cong \angle P$



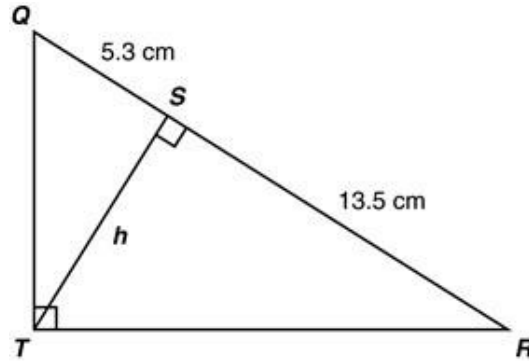
The student's proof is shown below.

<u>Statement</u>	<u>Reason</u>
1. $\angle W \cong \angle P$	1. Given
2. $\frac{TW}{PQ} = \frac{5}{7.5} = \frac{2}{3}$	2. Definition of ratio
3. $\frac{SW}{RP} = \frac{5}{7.5} = \frac{2}{3}$	3. Definition of ratio
4. $\triangle STW \sim \triangle RQP$	4. _____

Which reason is justification for statement 4?

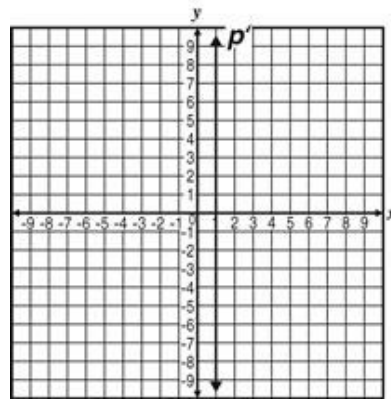
- A. Side-Side Similarity Theorem
- B. Side-Side-Side Similarity Theorem
- C. Side-Angle-Side Similarity Theorem
- D. Angle-Side-Angle Similarity Theorem

68. Right triangles TSQ and TSR represent two pieces of fabric that are joined together on a quilt to form a larger right triangle.



Which equation BEST represents h , the length of the seam joining the two pieces of fabric in centimeters?

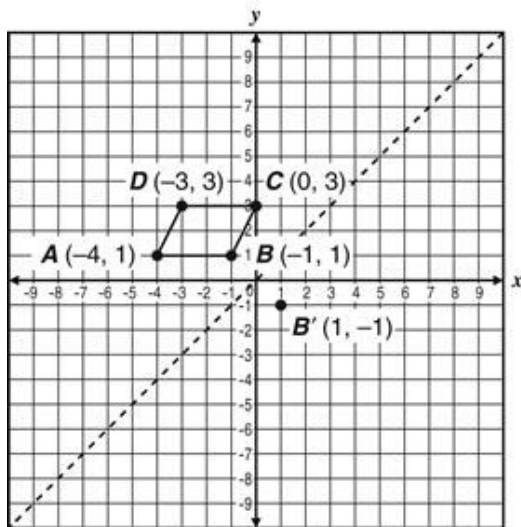
- A. $h = \sqrt{13.5 - 5.3} \approx 2.9$
 - B. $h = \sqrt{5.3 + 13.5} \approx 4.3$
 - C. $h = \sqrt{5.3 \cdot 13.5} \approx 8.5$
 - D. $h = \sqrt{13.5^2 - 5.3^2} \approx 12.4$
69. Line p' is the image of Line p reflected over $x = -3$.



Which equation represents Line p ?

- A. $x = -1$
- B. $x = -3$
- C. $x = -5$
- D. $x = -7$

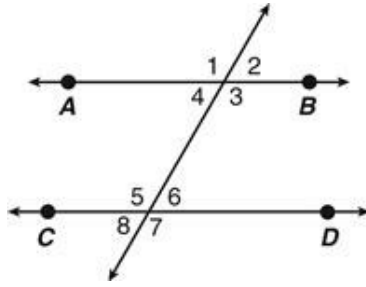
70. Ten cars were recently assembled at a factory. Of these cars, 3 will be picked at random for inspection. Of the 10 cars, 5 are blue and 5 are grey. What is the probability that all 3 cars picked for inspection will be blue?
- A. $\frac{3}{80}$
 B. $\frac{3}{50}$
 C. $\frac{1}{20}$
 D. $\frac{1}{12}$
71. Parallelogram $ABCD$ is being reflected over the dashed line, $y = x$. Point B' is the image of Point B following the reflection.



What are the coordinates of Point A' , the reflection of Point A ?

- A. $(4, -1)$
 B. $(3, -3)$
 C. $(3, 0)$
 D. $(1, -4)$
72. The function $t = \sqrt{\frac{h}{12}}$ describes the time, t , it takes for an object to fall from a given height, h . What is the range of this function?
- A. $t \geq 0$
 B. $t \geq 12$
 C. all real numbers
 D. all integers divisible by 12

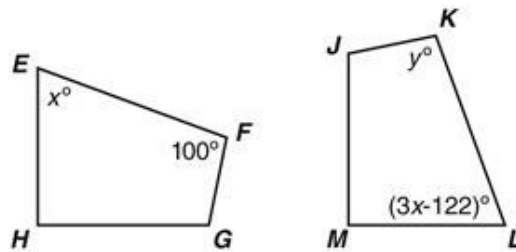
73. In the figure below, \overline{AB} is parallel to \overline{CD} .



Which statement proves that $\angle 3 \cong \angle 7$?

- A. If two parallel lines are cut by a transversal, the alternate interior angles are congruent.
- B. If two parallel lines are cut by a transversal, the alternate exterior angles are congruent.
- C. If two parallel lines are cut by a transversal, the corresponding angles are congruent.
- D. If two parallel lines are cut by a transversal, the vertical angles are congruent.

74. In the diagram, $EFGH \cong LKJM$.



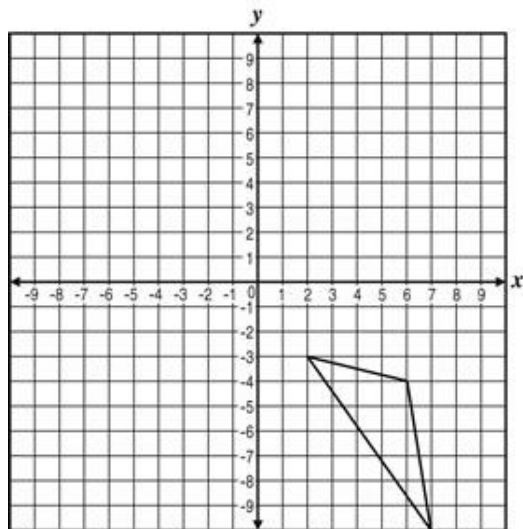
What is the value of x ?

- A. 61
- B. 74
- C. 80
- D. 100

75. Which statement is true if $\triangle MNP \sim \triangle XYZ$?

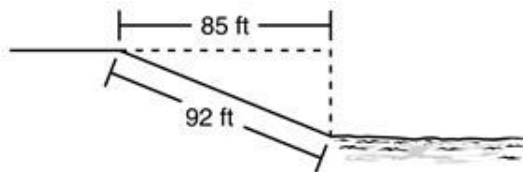
- A. Corresponding sides of $\triangle MNP$ and $\triangle XYZ$ are always congruent.
- B. Corresponding angles of $\triangle MNP$ and $\triangle XYZ$ are always congruent.
- C. $\triangle MNP$ and $\triangle XYZ$ always have equal areas.
- D. $\triangle MNP$ and $\triangle XYZ$ always have equal perimeters.

76. This triangle is reflected over the line $x = 4$.



Which transformation would produce the same image?

- A. reflecting over the x -axis and then translating to the right 4 units
 - B. reflecting over the y -axis and then translating to the right 4 units
 - C. reflecting over the x -axis and then translating to the right 8 units
 - D. reflecting over the y -axis and then translating to the right 8 units
77. The horizontal distance on a survey map from the top edge of a riverbank to the river is 85 feet (ft) as shown in the diagram below.



If the actual distance from the top edge of the riverbank to the surface of the river is 92 ft, which value is closest to the angle of depression from the horizontal distance?

- A. 22°
- B. 43°
- C. 47°
- D. 68°

78. Triangle PQR is mapped onto Triangle XYZ by Transformation T such that \overline{PQ} is congruent to \overline{XY} , \overline{QR} is congruent to \overline{YZ} , and $\angle Q$ is congruent to $\angle Y$. Which of the following could NOT describe Transformation T ?
- A. T is a dilation.
 - B. T is a rotation.
 - C. T is a reflection.
 - D. T is a translation.

79. A recent survey on pets and people found that there are about 68 million dogs and 73 million cats in the United States. The table shows where these pets sleep.

	Dog	Cat
Owner's Bed	15,178,000	23,455,000
Elsewhere in the Home	26,982,000	22,535,000
Outside	25,840,000	27,010,000

Given that a pet dog or cat sleeps in the home but NOT in the owner's bed, which percentage is closest to the probability that the pet is a cat?

- A. 15.98%
 - B. 30.87%
 - C. 45.51%
 - D. 83.52%
80. The table below shows the number of men and women who said in a recent survey that their favorite color was either blue or red.

	Blue	Red
Men	48	30
Women	17	35

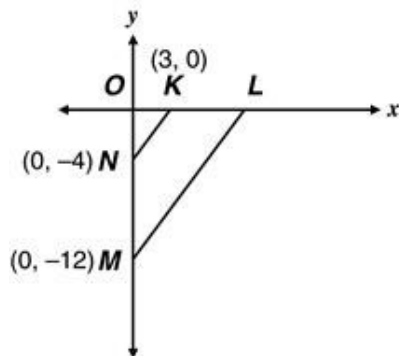
One person is chosen at random and is a woman. If favorite color is independent of gender, what is the probability that her favorite color will be blue?

- A. 0.33
- B. 0.37
- C. 0.40
- D. 0.50

81. Line segment \overline{ST} is rotated 90° counterclockwise to create segment $\overline{S'T'}$. Point L on \overline{ST} is defined by coordinates (x, y) . What are the coordinates of the corresponding point L' on segment $\overline{S'T'}$?

- A. $(x, -y)$
- B. $(-x, y)$
- C. (y, x)
- D. $(-y, x)$

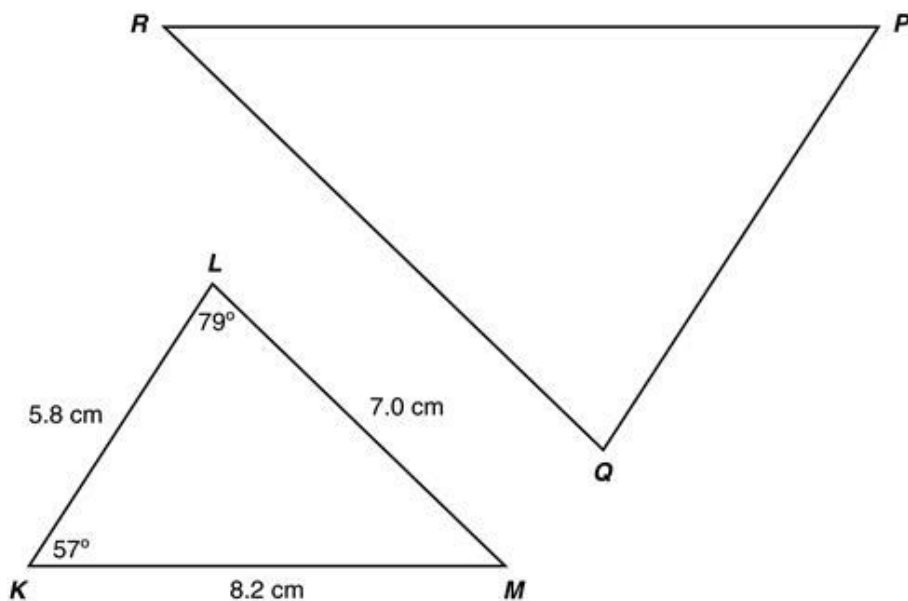
82. $\triangle KON$ is dilated with a scale factor of 3 to form $\triangle LOM$.



What are the coordinates of Point L ?

- A. $(1, 0)$
 - B. $(6, 0)$
 - C. $(9, 0)$
 - D. $(12, 0)$
83. The conditional probability $P(B|A)$ is the probability that Event B occurs given that Event A has occurred. Which formula can be used to determine this conditional probability?
- A. $P(B|A) = \frac{P(B)}{P(A)}$
 - B. $P(B|A) = \frac{P(A)}{P(B)}$
 - C. $P(B|A) = \frac{P(A \text{ and } B)}{P(A)}$
 - D. $P(B|A) = \frac{P(A \text{ or } B)}{P(A)}$

84. Triangles KLM and PQR are shown below.



Which statement is true if $\triangle KLM \sim \triangle PQR$?

- A. $m \angle R = 66^\circ$
 - B. $m \angle M = m \angle P$
 - C. $5.8(PR) = 8.2(PQ)$
 - D. $PR - 8.2 = QR - 7.0$
85. What is the y -intercept of the graph of the equation $y = (2x - 3)^2 + 7$?
- A. -3
 - B. 6
 - C. 7
 - D. 25

86. Jesse solved the system of equations in six steps as shown below.

$$y = -\frac{1}{2}x + 6$$

$$y = 2(x - 2)^2 - 2$$

Step 1: $2(x - 2)^2 - 2 = -0.5x + 6$

Step 2: $2(x^2 - 4x + 4) - 2 = -0.5x + 6$

Step 3: $2x^2 - 8x + 6 = -0.5x + 6$

Step 4: $2x^2 - 7.5x = 0$

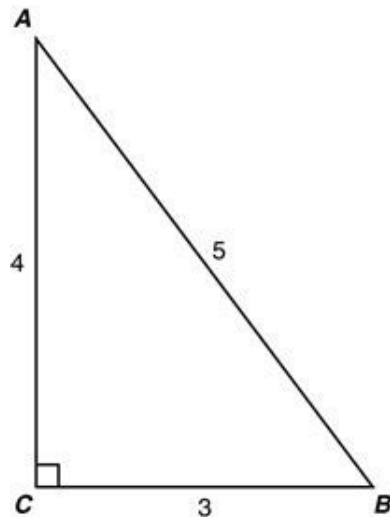
Step 5: $2x^2 = 7.5x$

Step 6: $x = 3.75$

When Jesse compared his work to the graph of the system, he realized that he only found one solution. Which is the first step in Jesse's work that should be corrected to reveal the second solution?

- A. Step 2
- B. Step 3
- C. Step 4
- D. Step 5

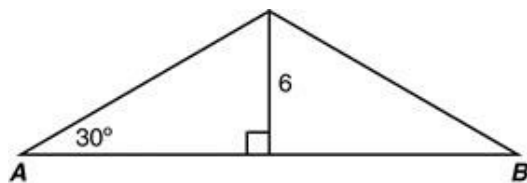
87. Right triangle ABC is shown below with the dimensions given in units.



What is the $\sin(A)$?

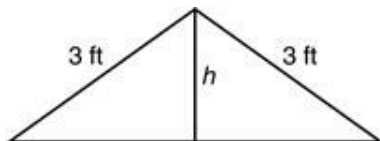
- A. $\frac{3}{5}$
- B. $\frac{3}{4}$
- C. $\frac{4}{5}$
- D. $\frac{5}{3}$

88. The drawing below represents the frame for an isosceles triangle-shaped roof. The height of the roof is 6 feet.



What is the distance from Point A to Point B in feet?

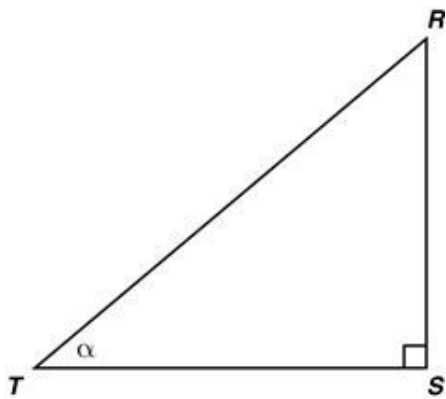
- A. $4\sqrt{3}$
B. 12
C. $12\sqrt{3}$
D. 24
89. Julian is flying a kite attached to a 100-foot-long string. If the string is tied to the ground at an angle of elevation of 40° , what is the approximate height of the kite from the ground?
- A. 64 feet
B. 77 feet
C. 84 feet
D. 100 feet
90. A window at the top of a building is in the shape of an isosceles right triangle as shown in the figure.



Which expression represents h , the distance from the peak of the window to its base in feet?

- A. $\frac{\sqrt{2}}{3}$
B. $\frac{3\sqrt{2}}{2}$
C. 3
D. $3\sqrt{2}$

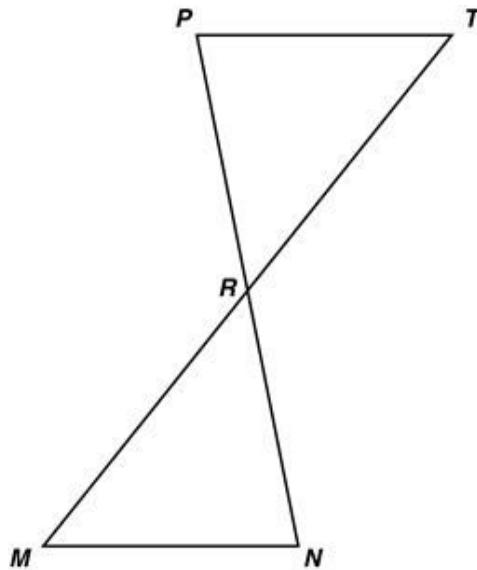
91. A right triangle is shown below.



Which equation represents a trigonometric ratio for the triangle?

- A. $\sec \alpha = \frac{RS}{TS}$
- B. $\tan \alpha = \frac{TS}{RS}$
- C. $\cos \alpha = \frac{RS}{RT}$
- D. $\sin \alpha = \frac{RS}{RT}$

92. In the figure shown, $\angle M \cong \angle T$, and R the midpoint of \overline{MT} .



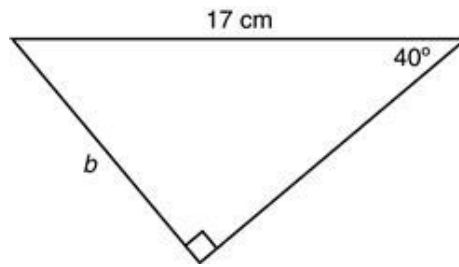
To prove $\overline{MN} \cong \overline{TP}$, a student wrote the following 6 statements.

1. $\angle M \cong \angle T$
2. R is the midpoint of \overline{MT}
3. $MR = TR$
4. $\angle MRN \cong \angle TRP$
5. $\triangle MRN \cong \triangle TRP$
6. $\overline{MN} \cong \overline{TP}$

Which reason should the student give for statement 5?

- A. Side-Angle-Side
- B. Side-Angle-Angle
- C. Angle-Side-Angle
- D. Angle-Angle-Angle

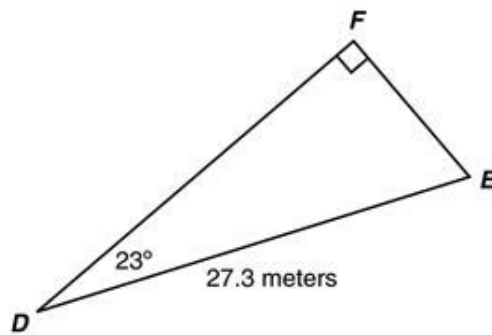
93. A right triangle is shown below.



Which value is closest to b in centimeters?

- A. 10.9 cm
 - B. 13.0 cm
 - C. 14.3 cm
 - D. 20.3 cm
94. What is the y -intercept of the graph of $y = \sqrt{x+4} + 5$?
- A. -4
 - B. 5
 - C. 7
 - D. This graph does not have a y -intercept.

95. Right triangle DEF is shown below.



What is DF to the nearest tenth of a meter?

- A. 10.7
- B. 11.6
- C. 25.1
- D. 29.7

96. Which expression is equivalent to $\sqrt{32x^{16}} - \sqrt{18x^{16}}$?
- A. $x^8\sqrt{14}$
 B. $x^4\sqrt{14}$
 C. $x^8\sqrt{2}$
 D. $x^4\sqrt{2}$
97. Suppose $L = \{-4, -2, 1, 3\}$ and $M = \{-2, 3, 7\}$. Which set represents $L \cup M$?
- A. $\{-4, -2, 1, 3, 7\}$
 B. $\{-4, 1\}$
 C. $\{-2, 3\}$
 D. $\{7\}$
98. Which expression is equivalent to $\frac{\sqrt[3]{32}}{\sqrt[3]{2}}$?
- A. $\sqrt[3]{4}$
 B. $2\sqrt[3]{2}$
 C. $4\sqrt[3]{2}$
 D. $8\sqrt[3]{2}$
99. Which expression is equivalent to $(6\sqrt[5]{3x})(2\sqrt[5]{6x^2})(3\sqrt[5]{3x})$?
- A. $11\sqrt[5]{12x^4}$
 B. $11\sqrt[5]{54x^4}$
 C. $36\sqrt[5]{12x^4}$
 D. $36\sqrt[5]{54x^4}$
100. The A+ Cell Company charges \$40 per month and \$0.30 per minute for each additional minute over 500 minutes. The cost can be written as a linear function, $C(x) = 0.3x + 40$, where x is the number of minutes over 500. If the company were to increase the \$40 charge to \$50, how would the graph of this function change?
- A. The graph would move up 10.
 B. The graph would move down 10.
 C. The graph would slide 0.10 to the left.
 D. The graph would slide 0.10 to the right.

101. How does the graph of $y = \sqrt{x}$ compare to the graph of $y = \sqrt{x} + 3$?
- A. The graph of $y = \sqrt{x} + 3$ is 3 units to the right of the graph of $y = \sqrt{x}$.
 - B. The graph of $y = \sqrt{x} + 3$ is 3 units to the left of the graph of $y = \sqrt{x}$.
 - C. The graph of $y = \sqrt{x} + 3$ is 3 units down from the graph of $y = \sqrt{x}$.
 - D. The graph of $y = \sqrt{x} + 3$ is 3 units up from the graph of $y = \sqrt{x}$.

102. Alyssa has written the following proof.

Given: E is the midpoint of \overline{AC} .
 $\overline{AB} \parallel \overline{DC}$

Prove: $\triangle AEB \cong \triangle CED$

Proof:

Statements	Reasons
1. E is the midpoint of \overline{AC} .	1. Given
2. $\overline{AB} \parallel \overline{DC}$	2. Given
3. $\overline{AE} \cong \overline{EC}$	3. Definition of midpoint
4. $\angle AEB \cong \angle CED$	4. Vertical angles are congruent.
5. $\angle EAB \cong \angle ECD$	5. If two parallel lines are intersected by a transversal, then alternate interior angles are congruent.
6. $\triangle AEB \cong \triangle CED$	6.

Which of the following would correctly complete Statement 6?

- A. SSS
 - B. SAS
 - C. ASA
 - D. AAS
103. The probability of the temperature dropping below the freezing level on Monday and Tuesday is 0.2 and 0.35, respectively. What is the probability that the temperature will NOT drop below freezing on both days?
- A. 0.07
 - B. 0.13
 - C. 0.28
 - D. 0.93

104. From a cliff, a ball was thrown downward at an initial velocity of 28 feet per second. The distance the ball had fallen is given by the function $d(t) = 16t^2 + 28t$, where t is the time elapsed in seconds. If the ball took 2 seconds to hit the ground below the cliff, how many seconds did the ball take to fall $\frac{1}{4}$ of the way to the ground?

- A. 0.125
- B. 0.5
- C. 0.75
- D. 1.0

105. The steps below show an attempt to solve $2x^2 - 2x + 9 = 0$.

Step 1 : $x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(9)}}{(2)(2)}$

Step 2 : $x = \frac{2 \pm i\sqrt{68}}{4}$

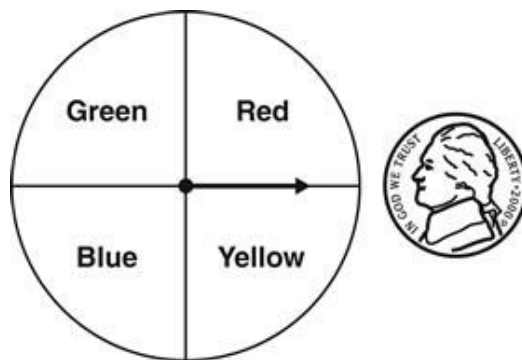
Step 3 : $x = \frac{1 \pm i\sqrt{34}}{2}$

Step 4 : $x \in \left\{ \frac{1 \pm i\sqrt{34}}{2} \right\}$

In which step does the first error occur?

- A. Step 1
- B. Step 2
- C. Step 3
- D. Step 4

106. The spinner below is divided into 4 equal parts. It is spun once, and the coin is flipped once.



What is the probability of obtaining red on the spinner followed by heads on the coin?

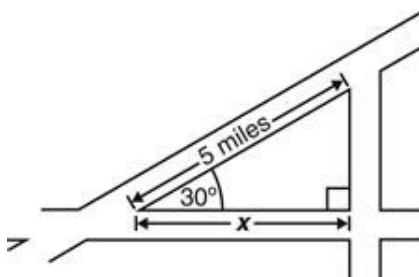
- A. $\frac{1}{8}$
- B. $\frac{1}{4}$
- C. $\frac{3}{4}$
- D. $\frac{7}{8}$

107. Which polynomial expresses the difference of the two polynomials below?

$$(-8k^4 + 3k^3 - 6) - (9k^4 - 11k^3 + 2)$$

- A. $-17k^4 + 14k^3 - 8$
- B. $-17k^4 + 14k^3 - 4$
- C. $-17k^4 - 8k^3 - 8$
- D. $-17k^4 - 8k^3 - 4$

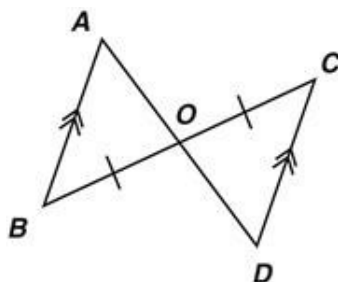
108. Three roads intersect to form a large triangular area as shown below.



What is the length, to the nearest tenth of a mile, of side x of the triangle?

- A. 2.5 miles
- B. 2.9 miles
- C. 4.0 miles
- D. 4.3 miles

109. In the diagram below, $\overline{AB} \parallel \overline{CD}$ and $\overline{BO} \cong \overline{CO}$.



Which reason justifies that $\triangle AOB \cong \triangle DOC$?

- A. Angle-Side-Angle
- B. Side-Angle-Side
- C. Hypotenuse-Leg
- D. Side-Side-Side

110. ¿Cuál polinomio expresa la diferencia de los dos polinomios a continuación?

$$(-4k^6 + 8k^2 - 8) - (2k^6 - 11k^2 + 5)$$

- A. $-6k^6 + 19k^2 - 13$
- B. $-6k^6 + 19k^2 - 3$
- C. $-6k^6 - 3k^2 - 13$
- D. $-6k^6 - 3k^2 - 3$

111. The probabilities of events R and S satisfy the following conditions:

- $P(R) = \frac{2}{3}$
- $P(S) = \frac{1}{4}$

If events R and S are independent, which represents $P(R \text{ and } S)$?

- A. $\frac{1}{6}$
- B. $\frac{1}{3}$
- C.
- D. $\frac{11}{12}$

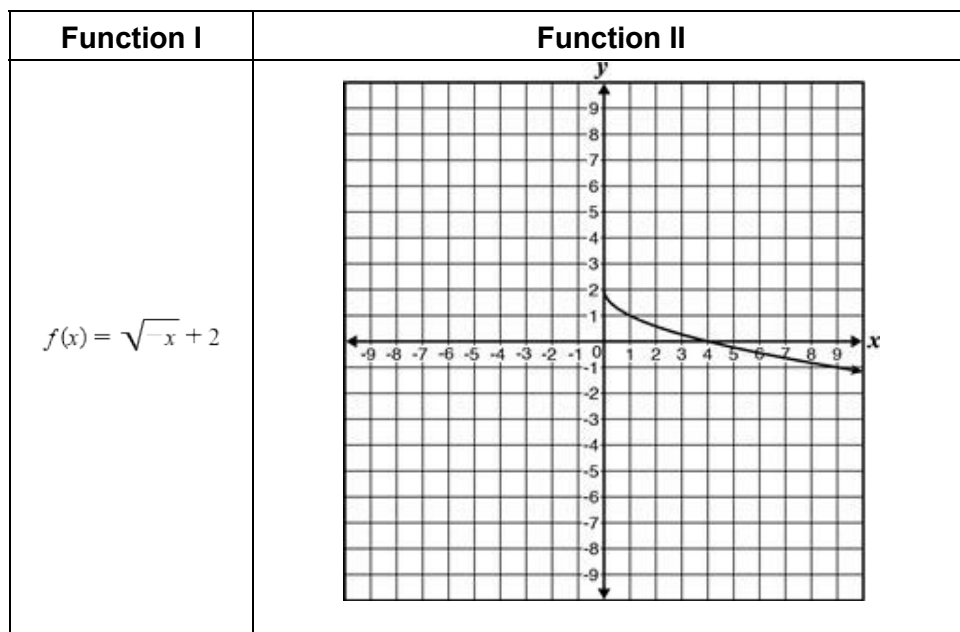
112. Which polynomial is the product of $(4x - 3)(3x^2 + 5x - 7)$?

- A. $12x^3 + 11x^2 - 43x + 21$
- B. $12x^3 + 29x^2 - 43x + 21$
- C. $12x^3 + 11x^2 - 43x - 21$
- D. $12x^3 + 29x^2 - 43x - 21$

113. Which expression is equivalent to $\sqrt{16x^8y^{13}z^{10}}$ in lowest terms?

- A. $8x^6y^{11}z^8$
- B. $8x^4y^6z^5\sqrt{y}$
- C. $4x^6y^{11}z^8$
- D. $4x^4y^6z^5\sqrt{y}$

114. Two square root functions are shown.



Which statement about these two functions is true?

- A. Both functions have the same maximum value.
- B. Both functions have the same domain.
- C. Both functions have a y -intercept of 2.
- D. All of the above

115. Keiko determined that the coordinate points $(-4, 0)$, $(-3, -1)$, and $(2, -6)$ are solutions to the following system.

$$y = -x - 4$$

$$y = x^2 + x - 12$$

Which coordinates from the solution set are reasonable solutions to the system of equations?

- A. $(-4, 0)$ only
- B. $(2, -6)$ and $(-4, 0)$
- C. $(-4, 0)$ and $(-3, -1)$
- D. None of the coordinate points are reasonable solutions.

116. The height after t seconds of an object projected upward with an initial velocity of 48 feet per second from a 210-foot tower can be modeled by $h = -16t^2 + 48t + 210$. The height of a neighboring 50-foot tall building is modeled by the equation $h = 50$. The time (t) when the object will be at the same height as the building is found to be $t = -2$ and $t = 5$. Which statement BEST describes the validity of these solutions?

- A. Neither solution is valid since time values cannot be squared.
- B. The solution $t = 5$ is the only valid solution to this system since time cannot be negative.
- C. Both are valid solutions to this system since both values make the equation $h = -16t^2 + 48t + 210$ true.
- D. The solution $t = -2$ is the only solution since 5 seconds is an unreasonable amount of time for the object to reach a height of 50 feet.

117. The following system of equations models the population (n) of two organisms after t days. Solving the system shows that the populations are equal for two values of t .

$$\begin{cases} n = 6t + 8 \\ n = 2t^2 \end{cases}$$

$$t = -1 \quad t = 4$$

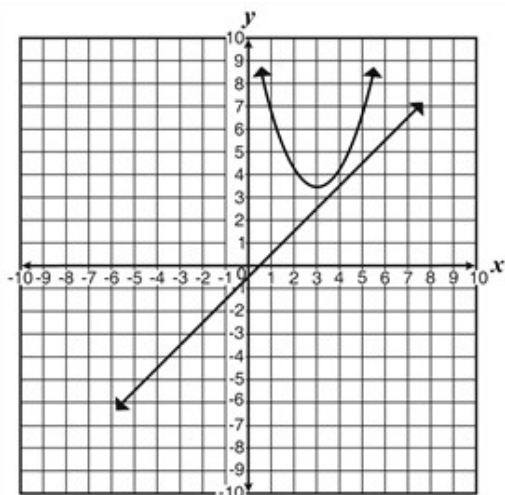
Which of the following statements supports the validity of these solutions?

- A. Both solutions are valid because the graphs of both solutions will intersect at $(-1, 2)$ and $(4, 32)$.
- B. Both solutions are valid because $6(-1) + 8 = 2(-1)^2$ and $6(4) + 8 = 2(4)^2$.
- C. The solution -1 is invalid because $6(-1) + 8$ equals 2 and $2(-1)^2$ equals -2 .
- D. The solution -1 is invalid because time cannot be negative.

118. Which expression is equivalent to $\sqrt{18x^{22}y^{19}z^{36}}$ in lowest terms?

- A. $3x^{11}y^9z^{18}\sqrt{2y}$
- B. $3x^{20}y^{17}z^{34}\sqrt{2}$
- C. $9x^{11}y^9z^{18}\sqrt{y}$
- D. $9x^{20}y^{17}z^{34}$

119. The graphs of a quadratic and linear equation are shown in the coordinate plane.



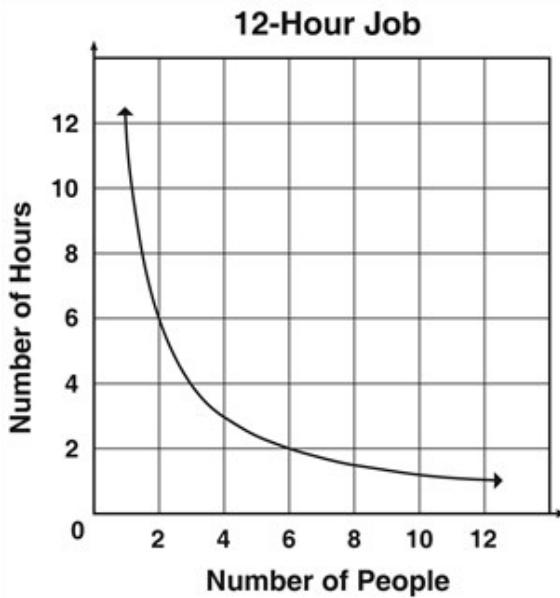
Which statement BEST describes the solutions to this system?

- A. There are 2 real solutions to this system.
- B. There are no real solutions to this system.
- C. There is only one real solution to this system.
- D. There are infinitely many real solutions to this system.

120. The number of possible string sections (s) to be cut from a 4-inch piece of string varies inversely with the length (l) of each of these string sections. Which equation models this relationship?

- A. $s = \frac{l}{4}$
- B. $s = \frac{4}{l}$
- C. $s = 4l$
- D. $s + l = 4$

121. Analyze the given graph, which models the number of hours (h) to complete a 12-hour job as being inversely proportional to the number of people (p) doing the job.



Which equation could be used to represent the information in this graph?

- A. $12h = p$
 - B. $h = 12p$
 - C. $ph = 12$
 - D. $p + h = 12$
122. The equation $y = -6x^2 - 3$ can be graphed in the coordinate plane. Changing the equation to $y = -6x^2 - 5$ makes which statement true?
- A. The graph is now narrower.
 - B. The graph is now opening upward.
 - C. The graph has now moved down the y -axis.
 - D. The graph now has a new axis of symmetry.
123. In the equation $y = 4x^2 - \frac{1}{4}$, changing the $-\frac{1}{4}$ to $(+4)$ will result in which change?
- A. moving the graph
 - B. inverting the graph
 - C. widening the graph
 - D. narrowing the graph

124. Which table represents a situation in which y varies inversely as x ?

A.

x	y
2	10
4	20
6	30
8	40

B.

x	y
2	20
4	10
5	8
40	1

C.

x	y
2	-2
6	-6
-4	4
0	0

D.

x	y
4	2
3	3
2	4
1	5

125. Which value is equivalent to i^{36} ?

A. i

B. -1

C. $-i$

D. 1

126. Kurt would like to create a graph that is wider than the graph of $y = \frac{3}{2}x^2 + 7$. Which change to the coefficient $\frac{3}{2}$ will NOT produce this result?

- A. Changing it to its reciprocal
- B. Changing it to its opposite
- C. Changing it to 1
- D. Changing it to $-\frac{1}{2}$

127. Given the equation $y = ax^2 - 5$ to graph, Terry chose 4 for the coefficient (a) and Jacob chose $\frac{3}{4}$. Which statement about the graphs is true?

- A. Terry's graph is located further up the y -axis than Jacob's.
- B. Terry's graph opens in the opposite direction of Jacob's.
- C. Terry's graph is located to the left of Jacob's graph.
- D. Terry's graph is narrower than Jacob's graph.

128. ¿Cuál polinomio expresa la diferencia de los dos polinomios a continuación?

$$(8u^7 + 5u^5 - 5) - (4u^7 - 8u^5 + 4)$$

- A. $4u^7 - 3u^5 - 9$
- B. $4u^7 - 3u^5 - 1$
- C. $4u^7 + 13u^5 - 9$
- D. $4u^7 + 13u^5 - 1$

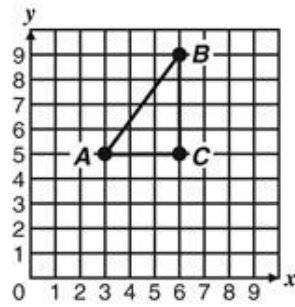
129. Triangle $A'B'C'$ is formed from Triangle ABC by the transformation $(x, y) \rightarrow (x + 2, y - 3)$. Exactly how many pairs of corresponding sides are parallel?

- A. 0
- B. 1
- C. 2
- D. 3

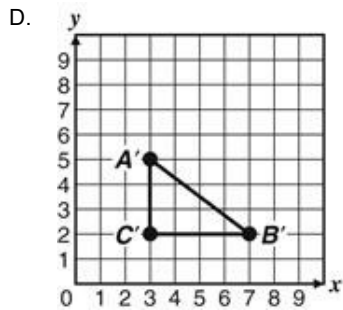
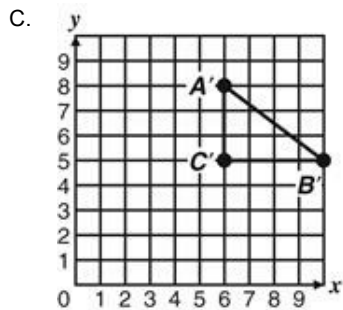
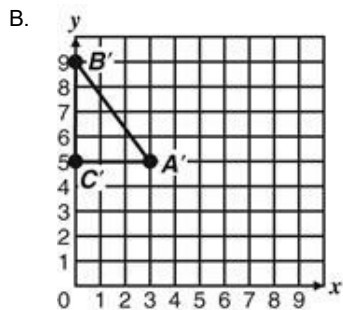
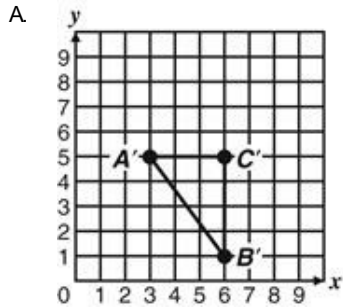
130. Un segmento de recta con extremos $(2, 4)$ y $(8, 6)$ fue dilatado por un factor de escala de 2 en Punto K . Los extremos resultantes son $(-1, 11)$ y $(11, 15)$. ¿Cuáles son las coordenadas de Punto K ?

- A. $(5, 9)$
- B. $(5, -3)$
- C. $(3, -7)$
- D. $(-3, -9)$

131. $\triangle ABC$ is rotated 90° clockwise about Vertex A to form $\triangle A'B'C'$.



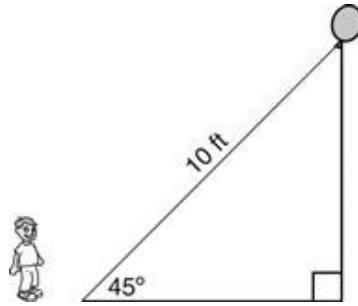
Which shows $\triangle A'B'C'$ in the correct position?



132. $(7x^3 - 4x^2 + 8) + (-2x^3 - 5x^2 - 1) =$

- A. $5x^3 - 9x^2 + 7$
- B. $9x^3 + x^2 + 9$
- C. $5x^6 - 9x^4 + 7$
- D. $9x^6 + x^4 + 9$

133. Josh tied a helium-filled balloon to a stake in the ground. The wind blew it so that the 10-foot string attached to the balloon made an angle of 45° with the ground.



What is the approximate height of the balloon from the ground?

- A. 3.2 feet
- B. 5.0 feet
- C. 7.1 feet
- D. 10.0 feet

134. Which polynomial expresses the difference of the two polynomials below?

$$(-4k^6 + 8k^2 - 8) - (2k^6 - 11k^2 + 5)$$

- A. $-6k^6 + 19k^2 - 13$
- B. $-6k^6 + 19k^2 - 3$
- C. $-6k^6 - 3k^2 - 13$
- D. $-6k^6 - 3k^2 - 3$