Released 2015 Achievement Test

Mathematics

GRADE 9

This document contains the test items from the 2015 Grade 9 Mathematics Achievement Test.

A test blueprint and an answer key are included in this document. These materials, along with the program of studies and subject bulletin, provide information that can be used to inform instructional practice.

Assessment Highlights reports for all achievement test subjects and grades will be posted on the Alberta Education website every year in the fall. *Assessment Highlights* provides information about the overall test, the test blueprints, and student performance on the 2015 Grade 9 Mathematics Achievement Test. Also provided is commentary on student performance at the acceptable standard and the standard of excellence on selected items from the 2015 achievement test. This information is intended for teachers and is best used in conjunction with the multi-year and detailed school reports that are available to schools via the extranet.

For further information, contact:
Kelly Rota, Grades 6 and 9 Mathematics Assessment Standards Team Leader, at Kelly.Rota@gov.ab.ca;
Sandy Myshak, Grades 6 and 9 Mathematics Examiner, at Sandy.Myshak@gov.ab.ca; or
Nicole Lamarre, Director, Student Learning Assessments and Provincial Achievement Testing, at Nicole.Lamarre@gov.ab.ca at the Provincial Assessment Sector, or call 780-427-0010. To call toll-free within Alberta, dial 310-0000.

The Alberta Education Internet address is education.alberta.ca.

Contents

2015 Grade 9 Mathematics Achievement Test Blueprint

Program of Study Strands	Reporting Category: Item Complexity			Number (Percentage) of Items
	Low Complexity Items	Moderate Complexity Items	High Complexity Items	
Number	1, 4, 12, 22, 28, NR 1, NR 6, NR 7, NR 10	9, 17, 18, 20, 30, 35	3	**16 (32%)**
Patterns and Relations	7, 19, 23, 25, 26, 29, 33, 37, NR 2, NR 5	2, 6, 15, 16, 31, 36	24	**17 (34%)**
Shape and Space	NR 3, NR 4	5, 8, 14, 27, 34, 39, NR 9	11, 32, 38	**12 (24%)**
Statistics and Probability	10, 13, 21	NR 8	40	**5 (10%)**
Number (Percentage) of Questions	**24 (48%)**	**20 (40%)**	**6 (12%)**	**50 (100%)**

Additional Information

The table below provides additional information about 49 of the 50 items that appeared on the 2015 Grade 9 Mathematics Achievement Test. (The results for students writing in French are presented in a separate report.)

Item	Key	Correct Response %	Item Complexity	Strand	Specific Outcome	Item Description
MC 1	D	83.6	L	N	2	Apply knowledge of the exponent laws to represent a power in an alternate form.
MC 2	D	41.9	M	PR	4	Write and solve a linear inequality that represents a given problem and represent the solution on a number line.
MC 3	C	76.1	H	N	6	Determine the square root value of a non-perfect square number and graph the value on a number line in relation to two consecutive perfect square numbers. (Gr.8, N.2)
MC 4	B	57.2	L	N	2	Apply the exponent laws to determine the value of a set of given expressions.
MC 5						
MC 6	A	61.2	M	PR	3	Select the algebraic expression that represents given information about a real-life context. (Gr.8, PR.2)
MC 7	B	63.6	L	PR	4	Translate a given problem into a single-variable linear inequality and solve the inequality algebraically.
MC 8	C	40.6	M	SS	1	Determine the distance between two locations in a circle diagram using one or more of the circle properties. (Gr.8, SS.1)
MC 9	D	56.3	M	N	1	Explain the difference between two given powers that have the base and the exponent interchanged.
MC 10	C	72.0	L	SP	4	Identify an assumption that was made in order to reach a given conclusion given the results of the survey.
MC 11	A	51.0	H	SS	1	Apply one or more circle properties to determine the distance between two points on a given circle diagram. (Gr.8, SS.1)
MC 12	B	59.1	L	N	6	Solve a given problem involving the square roots of numbers that are non-perfect squares. (Gr.8, N.2)
MC 13	D	64.7	L	SP	3	Analyze the graphs of four linear relations to draw a conclusion to a given question.

Item	Key	Correct Response %	Item Complexity	Strand	Specific Outcome	Item Description
MC 14	C	53.3	M	SS	2	Determine the surface area of a composite 3-D object given the volume of each component of the 3-D object. (Gr.8, SS.3; Gr.8, SS.4)
MC 15	B	55.7	M	PR	3	Solve a given linear equation to determine the value of the variable. (Gr.8, PR.2)
MC 16	B	46.5	M	PR	7	Simplify a given algebraic expression involving the multiplication and division of polynomial expressions by monomials.
MC 17	C	66.6	M	N	4	Apply knowledge of the order of operations to solve a problem.
MC 18	A	51.5	M	N	5	Determine the length of a 2-D design by determining the square root values of given rational numbers that represent the area of the 2-D shapes within the 2-D design. (Gr.8, N.1)
MC 19	A	52.4	L	PR	7	Model the multiplication of a given polynomial expression by a given monomial.
MC 20	D	58.2	M	N	1	Evaluate three powers to determine the side length of a given 3-D object.
MC 21	C	69.3	L	SP	2	Determine the most appropriate sample for a given survey.
MC 22	D	68.3	L	N	3	Represent the relationship among three different rational numbers by graphing them on a number line.
MC 23	A	72.3	L	PR	1	Write a linear equation that represents a given context. (Gr.8, PR.2)
MC 24	C	49.5	H	PR	2	Graph two linear relations to determine where the two relations intersect on the Cartesian plane. (Gr.8, PR.1)
MC 25	D	79.2	L	PR	1	Write a linear equation that represents the pattern described in a given table of values.
MC 26	A	48.8	L	PR	6	Simplify a given polynomial expression. (Gr.8, PR.2)
MC 27	B	47.9	M	SS	1	Determine the measure of an unknown angle in a circle diagram by using one or more of the circle properties.
MC 28	A	62.5	L	N	3	Solve a given problem involving operations on rational numbers given in fraction and decimal form. (Gr.8, N.6; Gr.7, N.2; Gr.7, N.5)

Item	Key	Correct Response %	Item Complexity	Strand	Specific Outcome	Item Description
MC 29	D	49.7	L	PR	6	Identify the pair of expressions that do not represent like terms when one expression is represented symbolically and the other expression is represented pictorially.
MC 30	B	54.1	M	N	2	Apply the exponent laws to evaluate and compare given expressions involving powers.
MC 31	A	39.9	M	PR	4	Identify the number line that represents the solution to a given linear inequality.
MC 32	B	75.7	H	SS	5	Complete a given 2-D shape by performing a single transformation to determine the angle of rotational symmetry of the completed 2-D shape. (Gr.7, SS.5)
MC 33	A	66.0	L	PR	2	Match the given graph of a linear relation with its corresponding linear equation. (Gr. 8, PR.1)
MC 34	D	40.9	M	SS	2	Identify a correct statement about the surface areas of three composite objects.
MC 35	A	57.7	M	N	4	Apply the order of operations to evaluate an expression involving rational numbers and powers.
MC 36	B	47.3	M	PR	6	Identify a polynomial that when added to the given polynomial expressions results in the desired sum.
MC 37	C	59.1	L	PR	5	Identify the number of terms and the degree in a given polynomial expression.
MC 38	A	53.0	H	SS	5	Identify the location of the vertices of a 2-D shape after completing a combination of transformations on the Cartesian plane. (Gr.7, SS.4; Gr.7, SS.5)
MC 39	C	44.6	M	SS	4	Determine an unknown side length of a polygon using the properties of similar polygons.
MC 40	B	63.6	H	SP	3	Identify the assumption that was made to reach the given conclusion based on a collection of data.
NR 1	1764	45.5	L	N	3	Match a set of given rational numbers to their corresponding points on a given number line. (Gr.6, N.7; Gr.7, N.7)

Item	Key	Correct Response %	Item Complexity	Strand	Specific Outcome	Item Description
NR 2	7	61.4	L	PR	2	Extend a given graph of a linear relation to determine the value of an unknown variable given the value of a second variable. (Gr.7, PR.2; Gr.8, PR.1)
NR 3	23	56.8	L	SS	4	Determine which objects in a given set of objects are similar to each other.
NR 4	3	70.2	L	SS	5	Complete the missing part a 2-D design by performing a single transformation given its line of symmetry. (GR.7, SS.5)
NR 5	15	86.1	L	PR	3	Represent a given problem using a linear equation and then solve the equation. (Gr.8, PR.2)
NR 6	2784	71.2	L	N	6	Identify the approximate location on a number line of the square roots of given rational numbers that are non-perfect square numbers. (Gr.8, N.2)
NR 7	435	52.2	L	N	3	Solve a given problem involving operations on rational numbers in decimal form.
NR 8	2143	46.9	M	SP	1	Identify a potential problem with the data collection for each survey in a given set of survey situations.
NR 9	112	74.8	M	SS	4	Calculate the height of a given 2-D object given the measurements and scale factor of its image after an enlargement.
NR 10	14	65.6	L	N	6	Identify the benchmarks that would give the most accurate estimation of the square root of a non-perfect square number. (Gr.8, N.2)

Grade 9 Mathematics Achievement Test
2015

1. Another representation of the expression $\left(\frac{2}{3}\right)^4$ is

A. $\frac{2+4}{3+4}$

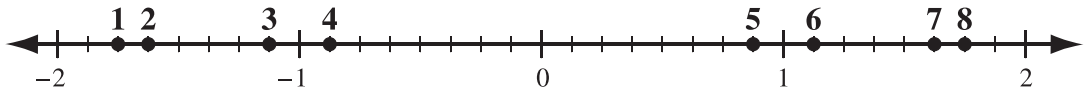
B. $\frac{2\times4}{3\times4}$

C. $\frac{2+2+2+2}{3+3+3+3}$

D. $\frac{2\times2\times2\times2}{3\times3\times3\times3}$

Use the following information to answer numerical-response question 1.

The eight labelled points on the number line shown below represent rational numbers.



Numerical Response

1. Match each of the following rational numbers to its corresponding point on the number line shown above.

$-1\frac{3}{4}$ is located at Point _____. (Record in the **first** column)

$\frac{13}{8}$ is located at Point _____. (Record in the **second** column)

1.125 is located at Point _____. (Record in the **third** column)

−0.875 is located at Point _____. (Record in the **fourth** column)

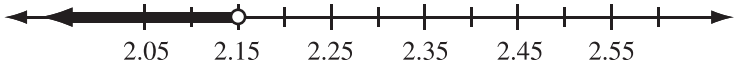
(Record your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 2.

Aaron buys a cheeseburger for $6.50 and a container of milk for $0.80. Sam buys a tossed salad and a bowl of soup. The soup costs $2.00 more than the salad. Sam's meal is less expensive than Aaron's meal.

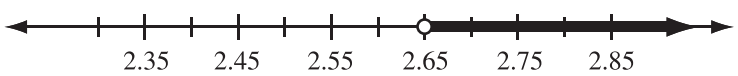
2. Which of the following number lines could represent the price of Sam's salad?

A.



B.

C.



D.

Use the following information to answer question 3.

The letters p and q in the expression $\sqrt{\frac{p+q}{2}}$ represent consecutive perfect square numbers.

3. Which of the following number lines **best** represents the value of $\sqrt{\frac{p+q}{2}}$?

A.

B.

C.

D.

Use the following information to answer question 4.

$(3^4)^2$ $\quad \frac{3^{12}}{3^4}$ $\quad 3^5 + 3^3$ $\quad [(3^{10})^0]^2$ $\quad \frac{(3 \times 2)^6}{2^6}$ $\quad 3^8 - 3^4$

4. How many of the expressions shown above have a value that is larger than 3^7?

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

Multiple-choice question 5 is not being released at this time.

Use the following information to answer question 6.

Catherine sells cupcakes, c, for \$1.50 each. The ingredients for each cupcake cost her \$0.30, and the sum of all of her other expenses is \$20.00/month.

6. Which of the following expressions represents Catherine's profit each month?

A. $1.5c - (20 + 0.3c)$

B. $20c - (1.5 + 0.3c)$

C. $(20 + 0.3c) - 1.5c$

D. $(1.5 + 0.3c) - 20c$

Use the following information to answer question 7.

Jennifer's goal is to save \$1 200. Each week she saves 20% of her weekly income of \$576.

7. How many weeks will it take Jennifer to reach her goal?

A. 10

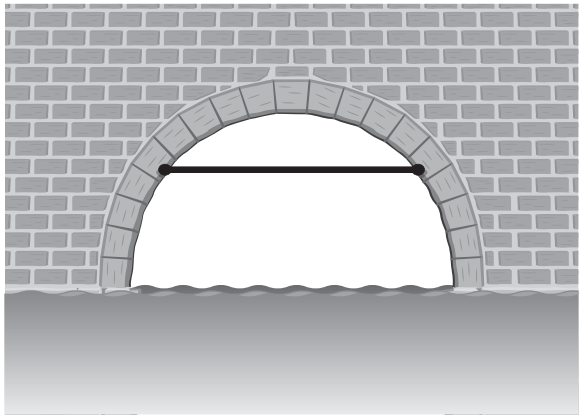
B. 11

C. 24

D. 29

Use the following information to answer question 8.

The arch in the diagram below forms a complete half-circle. The black support beam in the diagram is 3.6 m in length and is 3.0 m above the surface of the water.



Note: The diagram shown above has **not** been drawn to scale.

8. To the nearest tenth of a metre, the diameter of the arch is

A. 3.5 m

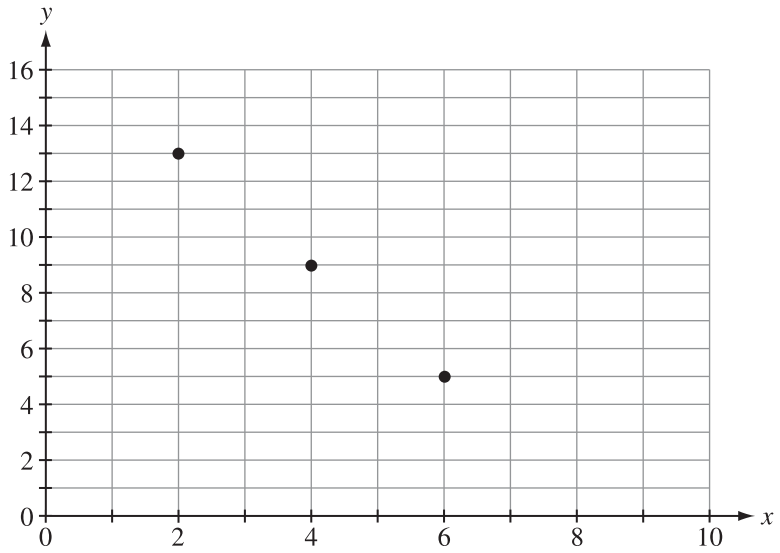
B. 4.7 m

C. 7.0 m

D. 9.4 m

Use the following information to answer numerical-response question 2.

The following graph represents a linear relation.



Numerical Response

2. Based on the linear relation shown above, when the y-coordinate is 3, the x-coordinate is _____.

(Record your answer in the numerical-response section on the answer sheet.)

9. *The values of 4^5 and 5^4 are* ___***i***___ *because* ___***ii***___ .

The statement above is completed by the information in row

	i	***ii***
A.	equal	4×5 has the same value as 5×4
B.	equal	both powers represent the same model
C.	not equal	two powers cannot have the same value
D.	not equal	they cannot be written using the same repeated multiplication

Use the following information to answer question 10.

A manager selected 25 watches to test from a batch of 750 watches. He determined that 3 of the selected watches were defective. Based on the results of his survey, the manager concluded that 12% of the 750 watches were defective.

10. Which of the following assumptions did the manager use to reach his conclusion?

A. The process for testing the watches was unreliable.

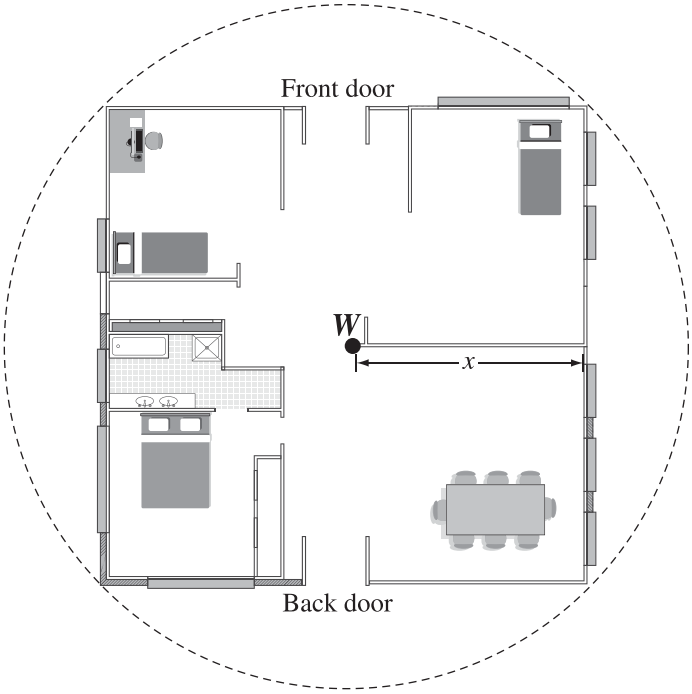
B. The parts used in the watches are rarely defective.

C. The sample was representative of the population.

D. The watches were made by the same employee.

Use the following information to answer question 11.

The letter *W* is in the centre of the diagram below and represents the location of a wireless router for Internet access in a square house. The router provides access to the area represented by the dotted circle in the diagram below. This circular area has a diameter of 20 m.



11. To the nearest tenth of a metre, the distance, *x*, from the router, *W*, to the middle of one outside wall is

A. 7.1 m

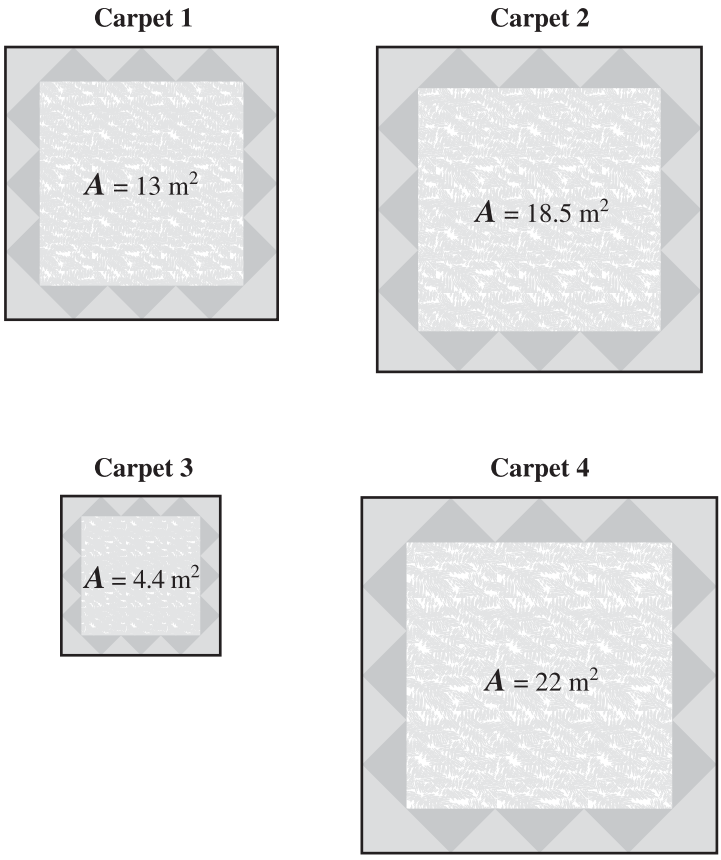
B. 8.9 m

C. 10.0 m

D. 14.1 m

Use the following information to answer question 12.

The area, A, of four square carpets is shown below.



12. Which carpet will cover the most floor area, without touching a wall, when it is laid flat in a square room that has a width of 4.5 m?

A. Carpet 1

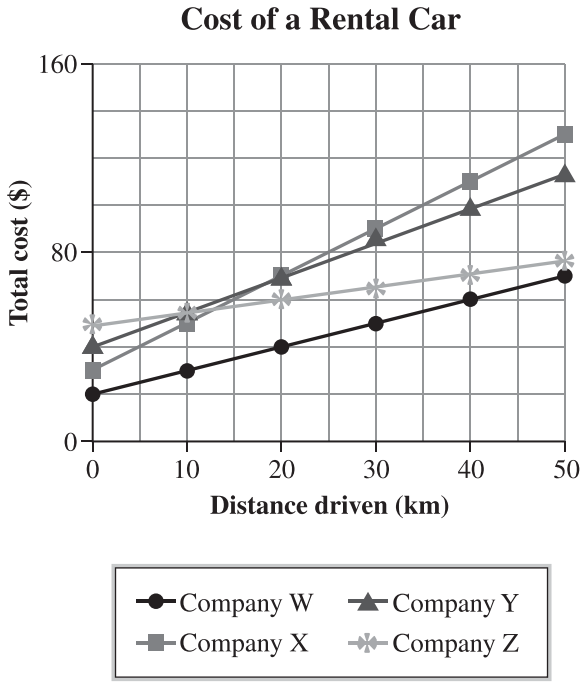
B. Carpet 2

C. Carpet 3

D. Carpet 4

Use the following information to answer question 13.

The cost of renting a car includes the base fee and a charge for each kilometre driven. The graph below represents the total cost of renting a vehicle at four different rental car companies.



13. Which rental car company has the smallest charge for each kilometre driven?

A. Company W

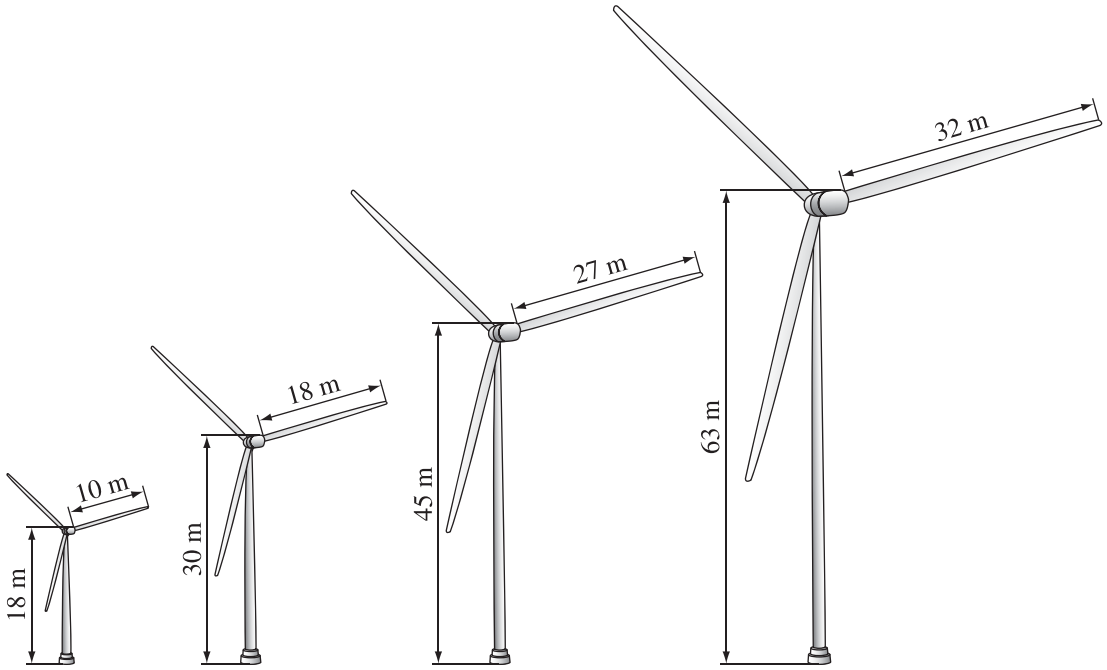
B. Company X

C. Company Y

D. Company Z

Use the following information to answer numerical-response question 3.

Four examples of wind turbines are shown below.



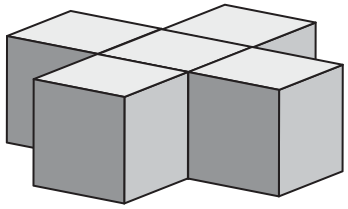
Numerical Response

3. Considering the blade length and the height of each wind turbine, the two turbines that are proportional to each other are turbines _____ and _____.

(Record **both digits** of your answer **in any order** in the numerical-response section on the answer sheet.)

Use the following information to answer question 14.

The following 3-D object is composed of identical cubes. The volume of each cube is 8 cm^3.



14. What is the **total** surface area of the 3-D object shown above?

A. 120 cm^2

B. 100 cm^2

C. 88 cm^2

D. 72 cm^2

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15. The value of x in the equation $3(2x - 1) = \frac{1}{2}(x + 6)$ is

A. $\frac{8}{11}$

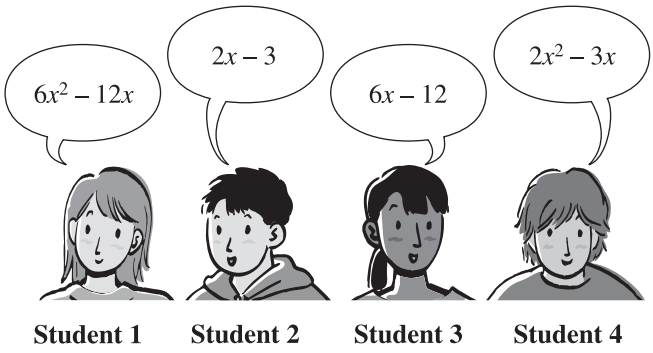
B. $\frac{12}{11}$

C. $\frac{14}{11}$

D. $\frac{18}{11}$

Use the following information to answer question 16.

Four students simplified the expression $\frac{3x(4x-6)}{2(3x)}$. Their answers are shown below.



16. Which student correctly simplified the expression?

A. Student 1
B. Student 2
C. Student 3
D. Student 4

Use the following information to answer question 17.

The letters ***P*** and ***Q*** each represent an integer in the expression below.

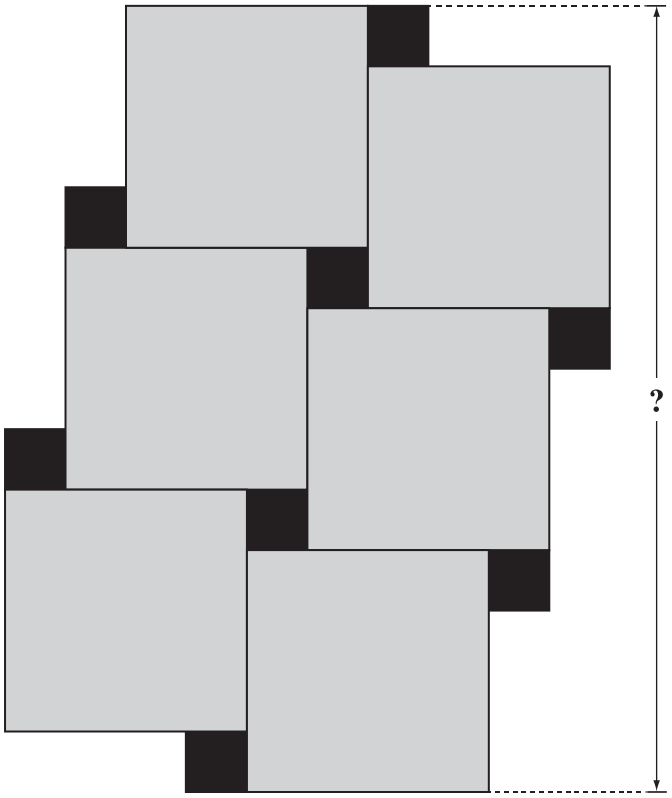
$$2 \times P^3 - 6 \div Q$$

17. Which of the following values for ***P*** and ***Q*** would result in the lowest value for the expression shown above?

Row	*P*	*Q*
A.	−2	−2
B.	2	−2
C.	−2	2
D.	2	2

Use the following information to answer question 18.

Each grey square in the design below has an area of 77.44 cm^2, and each black square has an area of 4.84 cm^2.



18. To the nearest tenth of a centimetre, what is the height of the design shown above?

A. 28.6 cm

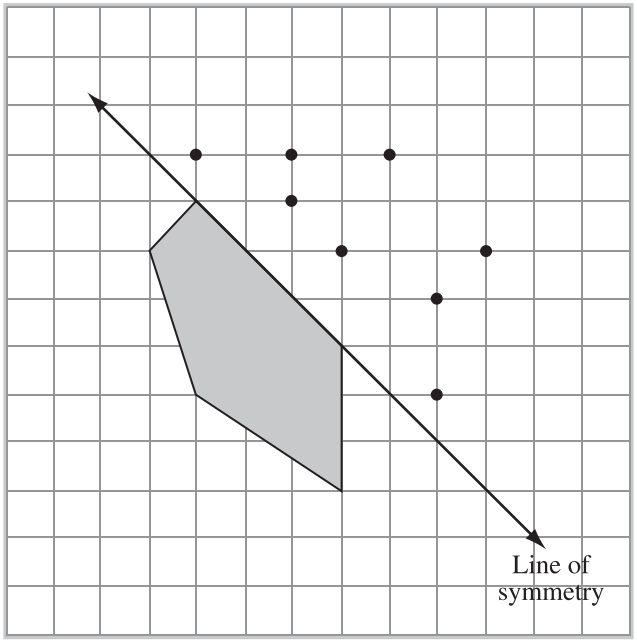
B. 33.0 cm

C. 35.2 cm

D. 59.3 cm

Use the following information to answer numerical-response question 4.

An incomplete 2-D shape and its line of symmetry are shown in the diagram below.



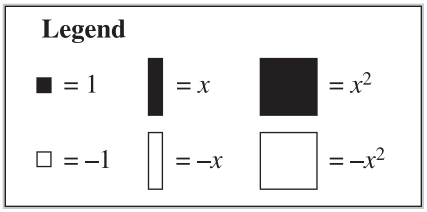
Numerical Response

4. When the 2-D shape is completely drawn, how many points will be inside the 2-D shape?

Answer: _____

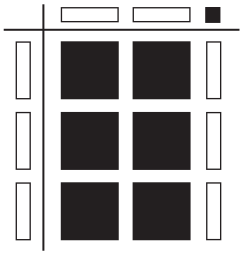
(Record your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 19.

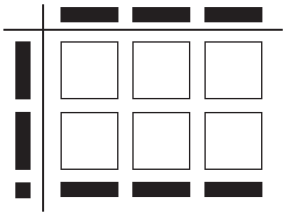


19. Which of the following models could be used to represent the division of $6x^2 - 3x$ by $-3x$?

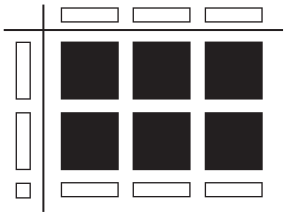
A.



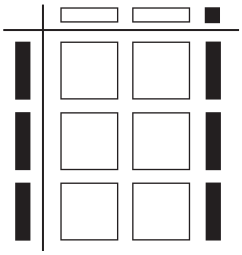
B.



C.

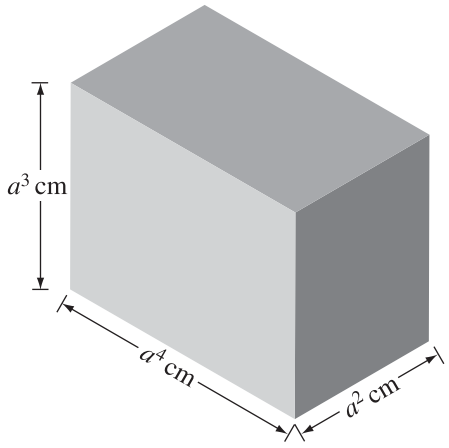


D.



Use the following information to answer question 20.

The shortest edge of the rectangular prism shown below is 64 cm.



Note: The diagram shown above has **not** been drawn to scale.

20. The length of the longest edge is

A. 256 cm
B. 512 cm
C. 1 024 cm
D. 4 096 cm

Use the following information to answer question 21.

The organizer of a 16-team soccer tournament wants to conduct a survey to determine the minimum number of games each team in the tournament would like to play.

21. Which of the following samples would provide the most reliable results for her survey?

A. One player each from half of the teams

B. Every fourth team that registers in the tournament

C. Three randomly selected players or coaches from each team

D. All of the players and coaches from one randomly selected team

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Use the following information to answer numerical-response question 5.

In one month, Dale earned $180.00. He earned $45.00 by washing cars, and the rest by mowing lawns.

Numerical Response

5. How many lawns did Dale mow if he received $9.00 for each lawn that he mowed?

Answer: _____ lawns

(Record your answer in the numerical-response section on the answer sheet.)

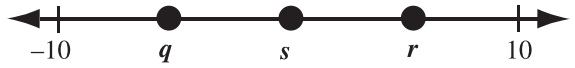
Use the following information to answer question 22.

Variables q, r, and s represent rational numbers.

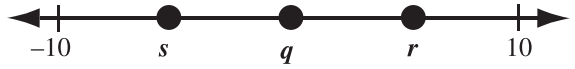
$$q > r$$
$$s = q + 1$$

22. Which of the following number lines represents the order of the three rational numbers?

A.

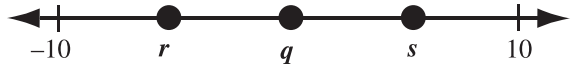


B.



C.

D.



Use the following information to answer question 23.

Alice works 8 hours a day as a waitress in a restaurant. She earns $12.50 an hour plus money received from tips, t.

23. Which of the following equations represents Alice's total earnings, E, for one day of work?

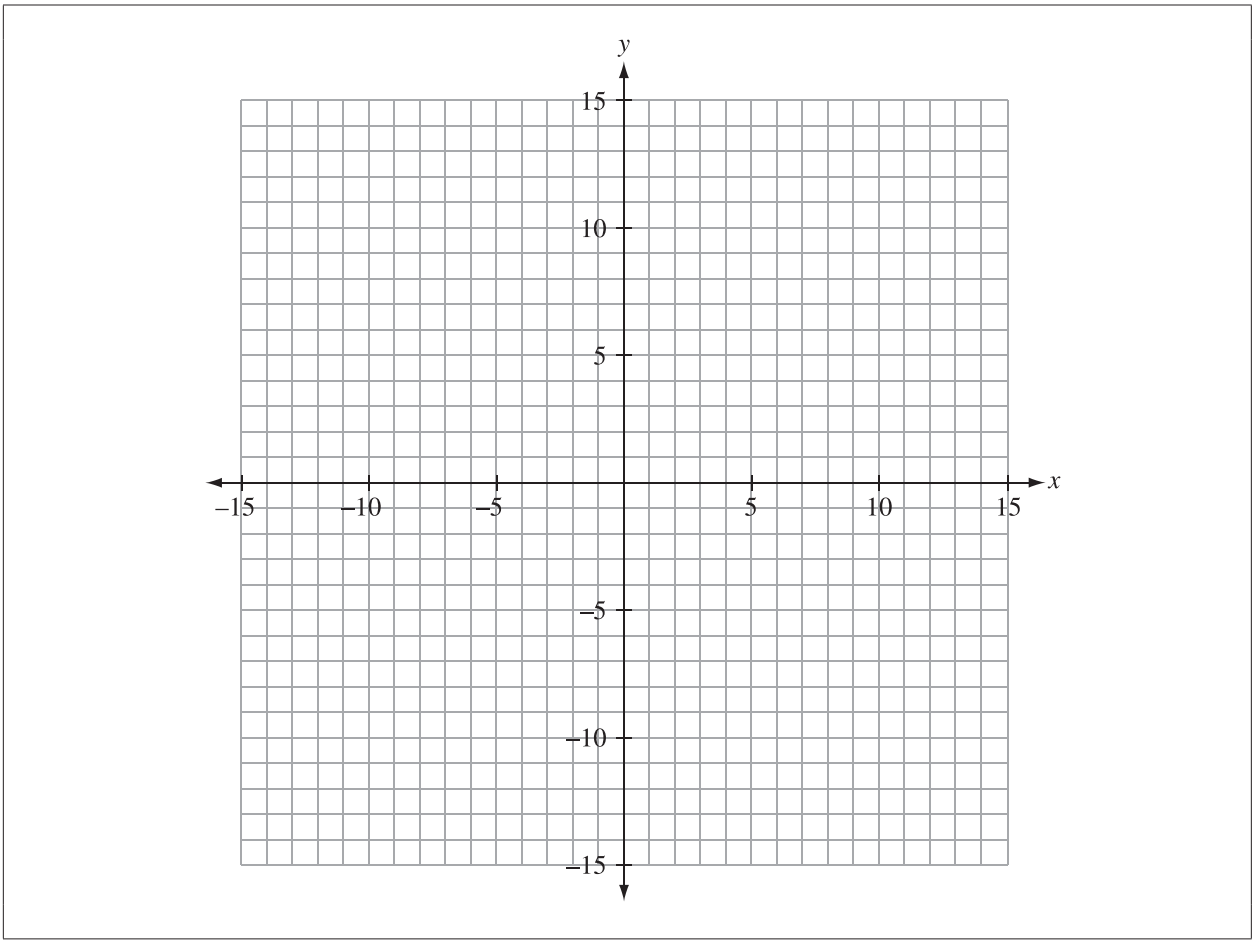
A. $E = 8(12.50) + t$

B. $E = 8(12.50 + t)$

C. $E = 8t + 12.50$

D. $E = 8 + 12.50t$

Use the following information to answer question 24.



24. The graphs of the relations $3x + y = 17$ and $y = x + 1$ intersect at the point with the coordinates

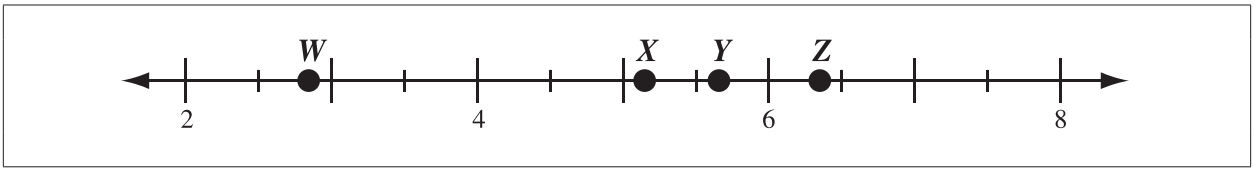
A. (0, 1)

B. (3, 8)

C. (4, 5)

D. (5, 4)

Use the following information to answer numerical-response question 6.



Numerical Response

6. Match each point on the number line above to the corresponding number in the table below.

Code	Number
1	$\sqrt{37}$
2	$\sqrt{8}$
3	$\sqrt{22}$
4	$\sqrt{41}$
5	$\sqrt{6}$
6	$\sqrt{50}$
7	$\sqrt{27}$
8	$\sqrt{32}$

Code:	_____	_____	_____	_____
Point:	***W***	***X***	***Y***	***Z***

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 25.

David creates the table of values shown below based on designs he assembles using black and white 2-D shapes.

Number of Black Shapes (b)	Number of White Shapes (w)
2	7
3	9
4	11

25. Which of the following equations represents the linear relationship between the number of black shapes and the number of white shapes?

A. $5b - 3 = w$

B. $4b - 1 = w$

C. $3b + 1 = w$

D. $2b + 3 = w$

---

26. When the expression $(x^2 - 5x + 4) - (3x^2 + 8x - 20)$ is simplified, the result is

A. $-2x^2 - 13x + 24$

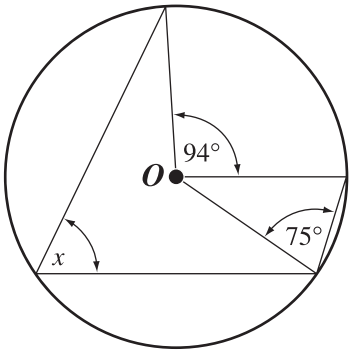
B. $-2x^2 - 3x + 16$

C. $2x^2 + 13x - 24$

D. $2x^2 + 3x - 16$

Use the following information to answer question 27.

Point *O* in the diagram below represents the centre of the circle.



27. The value of angle x is

A. 47°
B. 62°
C. 75°
D. 90°

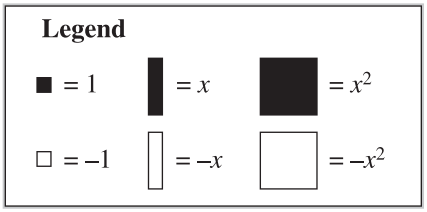
Use the following information to answer question 28.

On a bike trip, Patrick rides at a constant speed of 14.4 km/h for $\frac{3}{4}$ of an hour and then at a constant speed of 13.2 km/h for $\frac{1}{3}$ of an hour.

28. How many kilometres in total did Patrick travel on the bike trip?

A. 15.2 km
B. 15.0 km
C. 14.7 km
D. 14.3 km

Use the following information to answer question 29.



29. Which of the following pairs of expressions represents like terms?

A. $3x$ and ■■■

B. $-6x^2$ and □□□□

C. $-2(4x)$ and ■■■■■

D. $4(-1x)$ and ▬▬▬

Use the following information to answer question 30.

Expression 1 $(2^2)^3 + 2^2$

Expression 2 $4^2 + 4^3 - (4^3)^0$

Expression 3 $3^4 - 3^2$

30. Which of the following rows correctly identifies the expression with the lowest value and the expression with the highest value?

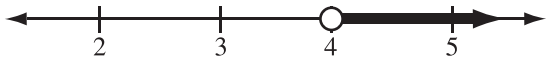
Row	Lowest Value	Highest Value
A.	Expression 1	Expression 3
B.	Expression 1	Expression 2
C.	Expression 3	Expression 2
D.	Expression 3	Expression 1

31. Which number line shown below represents the solution to $4(2x - 1) > 4x + 8$?

A.

B.

C.



D.

Use the following information to answer numerical-response question 7.

A store owner pays a sales clerk \$12/h for each hour worked. The assistant manager of the store earns one-and-a-half times the clerk's hourly wage and the manager of the store earns two-and-a-half times the clerk's hourly wage.

Numerical Response

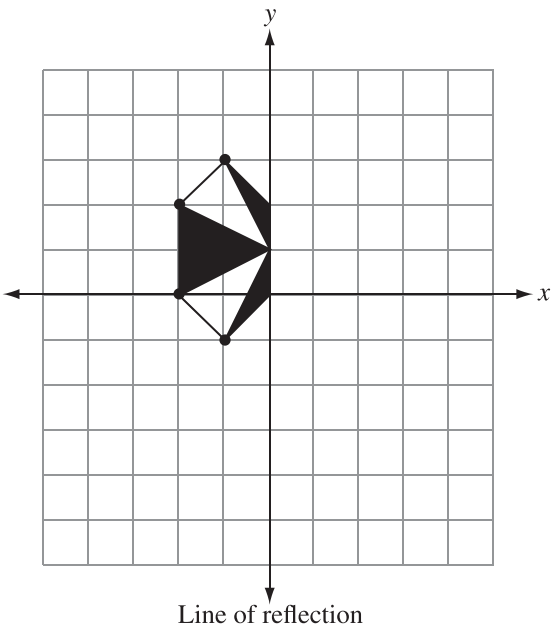
7. In total, how much money is paid to the three employees in one day if the sales clerk, the assistant manager, and the manager each work 7.25 h?

Answer: \$_____

(Record your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 32.

The 2-D shape shown on the Cartesian plane below is reflected about the *y*-axis.



32. If the original 2-D shape and the reflected image combine to form a new 2-D shape, what is the angle of rotational symmetry of the new 2-D shape?

A. 90°

B. 180°

C. 270°

D. 360°

Use the following information to answer numerical-response question 8.

Consider the following four surveys.

1 Customers in an electronics store are asked whether they would purchase last year's model of a television or wait for this year's new and improved model.

2 A random sample of Grade 9 boys is asked to determine which snacks should be available in the school's vending machine.

3 During the summer, every household in a large community is asked to complete a detailed questionnaire to help determine whether the local skating rink should be renovated.

4 Grade 6 students are asked how many times they wash their hair each week.

Numerical Response

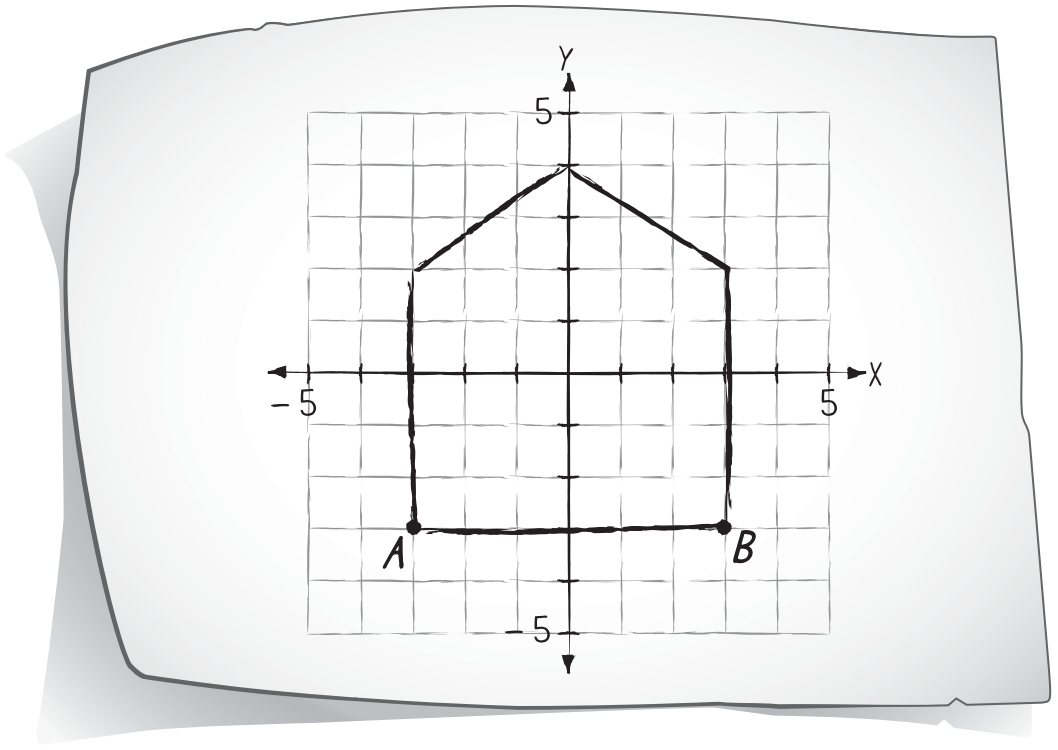
8. Match each survey listed above with the potential data collection problem it **best** represents.

Survey:	_____	_____	_____	_____
Data collection problem:	**Bias**	**Use of Language**	**Privacy**	**Time and Timing**

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 33.

Carly drew a design on the Cartesian plane shown below.



33. Which of the following equations describes line segment *AB* on the Cartesian plane shown above?

A. $y = -3$

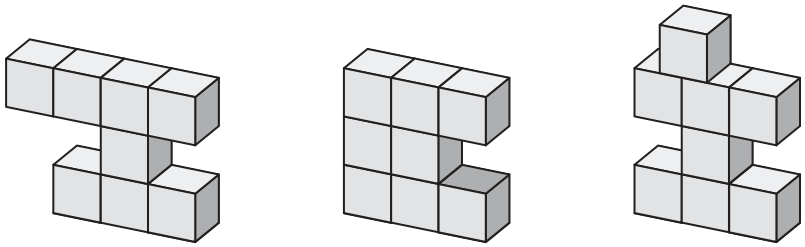
B. $y = 3$

C. $x = -3$

D. $x = 3$

Use the following information to answer question 34.

The three composite objects shown below are each constructed from 8 identical cubes.



Object **1** Object **2** Object **3**

34. Which of the following statements correctly describes the relationship between the composite objects?

A. Object 2 has a greater surface area than Object 1.

B. The surface areas of the three objects are the same.

C. Object 3 has a greater surface area than both Object 1 and Object 2.

D. The surface area of Object 1 is equal to the surface area of Object 3.

---

35. What is the value of the expression $6 - \frac{1}{4} \div \frac{1}{2} - 2^3 \times 0.75$?

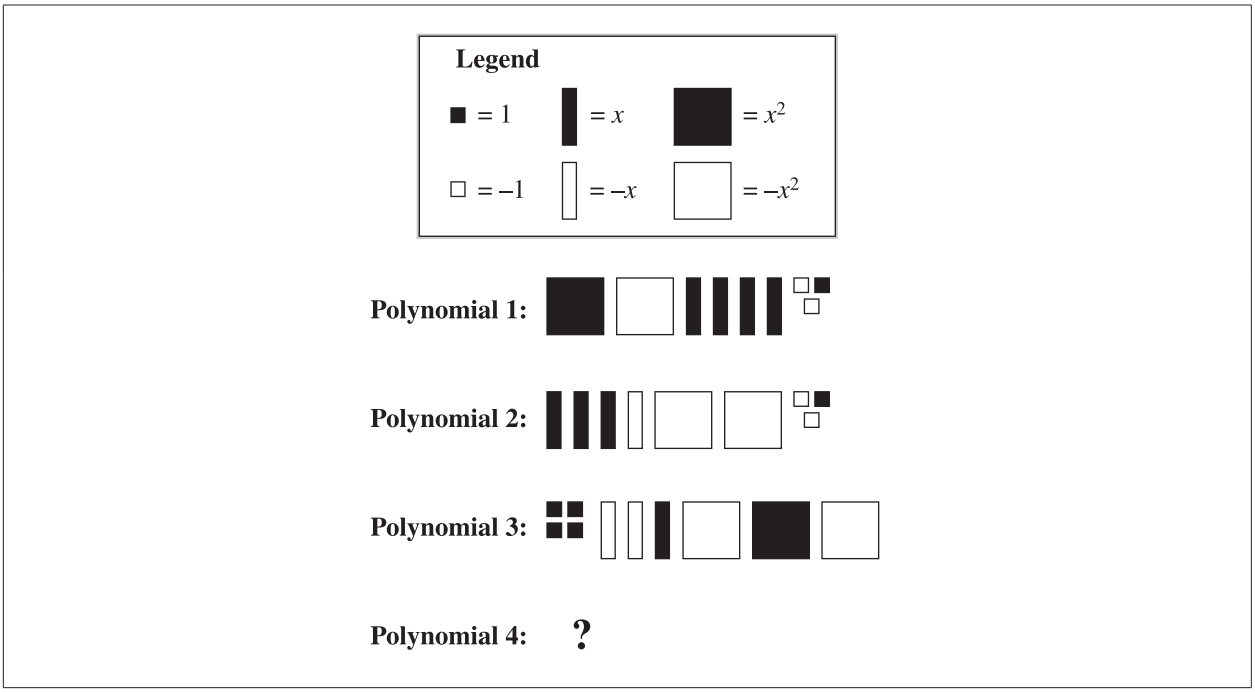
A. $-\frac{1}{2}$

B. $-\frac{1}{8}$

C. $\frac{1}{8}$

D. $\frac{1}{2}$

Use the following information to answer question 36.



36. Which of the following expressions could represent Polynomial 4 if the sum of all four expressions is $6x$?

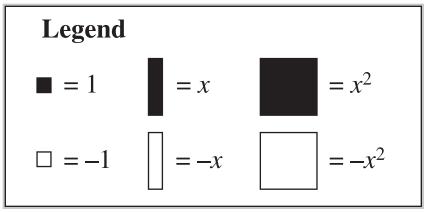
A. $9x^2 - 5x - 1$

B. $3x^2 + x - 2$

C. $-x^2 - x + 5$

D. $-3x^2 + 11x + 1$

Use the following information to answer question 37.



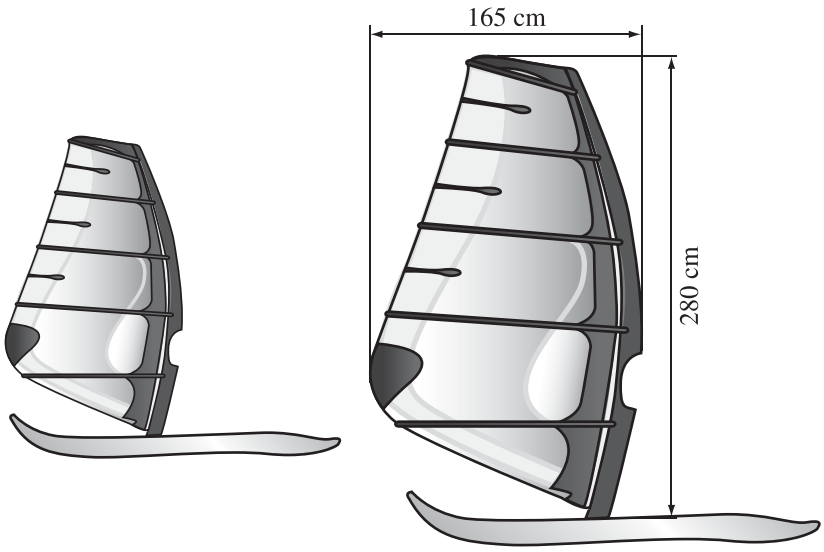
The diagram below is a model of a polynomial expression.

37. Which of the following rows correctly describes the modelled polynomial expression?

	Number of Terms	**Degree**
A.	2	2
B.	2	4
C.	3	2
D.	3	4

Use the following information to answer numerical-response question 9.

The large sail shown below is an enlargement of the small sail.



Numerical Response

9. What is the height of the small sail if the scale factor of the enlargement is 2.50?

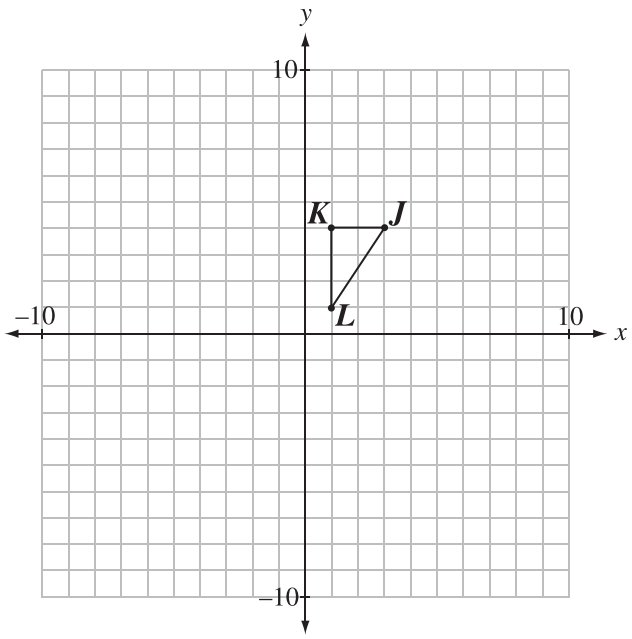
Answer: _____ cm

(Record your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 38.

Triangle *JKL,* shown below, undergoes the following transformations:

- a translation of 3 units left and 4 units down, followed by
- a 90° clockwise rotation about vertex L'

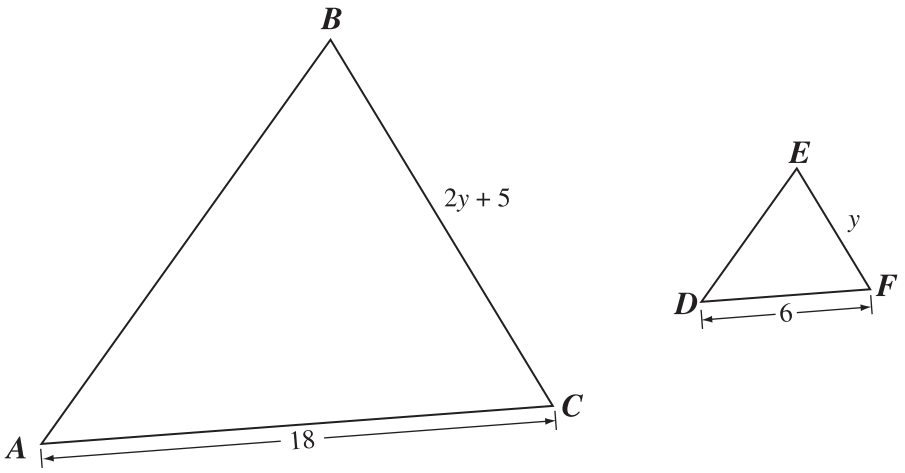


38. Which of the following rows represents the ordered pair for each vertex after **both** the transformations described above have been completed?

Row	J''	K''	L''
A.	(1, –5)	(1, –3)	(–2, –3)
B.	(–5, –1)	(–5, –3)	(–2, –3)
C.	(0, –4)	(0, –2)	(–3, –2)
D.	(–2, –3)	(1, –3)	(1, –5)

Use the following information to answer question 39.

Triangle *ABC* is similar to triangle *DEF*.



39. What is the length of side *BC*?

A. 11

B. 13

C. 15

D. 17

Use the following information to answer question 40.

The chart below shows the life expectancies, at birth, of males and females in a particular country over 40 years.

Year of Birth	Life Expectancy at Birth (years)	
	Male	Female
1970	67.1	74.1
1980	70.0	76.5
1990	71.8	78.5
2000	74.3	79.6
2010	75.2	80.4

40. Which of the following assumptions supports the prediction that a female born in the year 2020 in this country will live to the age of 80.7 years?

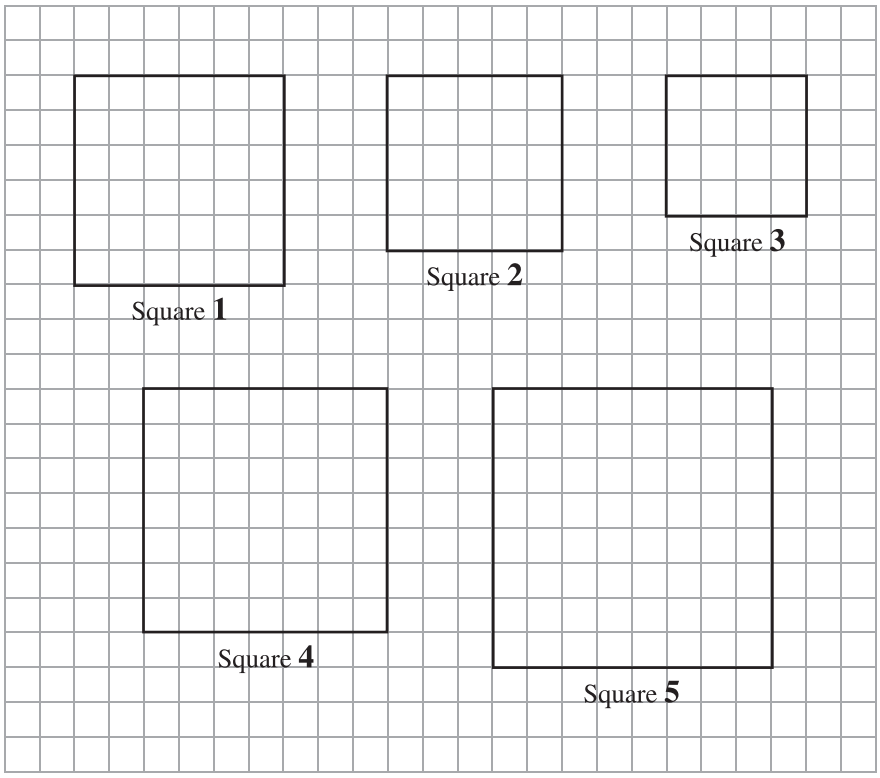
A. Females in this country live longer than males.

B. The life expectancy for females will continue to slowly increase.

C. Changes in the environment will reduce life expectancies by 2020.

D. The gap between the life expectancies of males and females will be smaller in 2020.

Use the following information to answer numerical-response question 10.



Numerical Response

10. Which two squares shown above represent the **best** benchmarks for estimating the value of $\sqrt{43}$?

Answer: Square _____ and Square _____

(Record **both digits** of your answer **in any order** in the numerical-response section on the answer sheet.)

You have now completed the test.
If you have time, you may wish to check your answers.