[AB.9.N.6]

$$\sqrt{61}\ \sqrt{66}\ \sqrt{71}\ \sqrt{77}\ \sqrt{80}\ \sqrt{88}\ \sqrt{96}\ \sqrt{99}$$

How many of the square roots shown above have a value between 8.8 and 9.9?

- ○ 3
- ○ 4
- ○ 5
- ○ 6

[AB.9.PR.1]

Dance students at Tracee's Dance Arts and Starz pay a yearly application fee in addition to a monthly tuition of $35. The following table shows the total amount paid by a student at the dance school for a certain number of months.
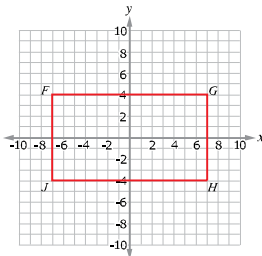
Number of Months	Total Amount Paid
2	$90
5	$195
9	$335

What is the cost of the yearly application fee?

[   ] dollars

This 2-D shape is rotated around its centre. [AB.9.SS.5]

What are the angle of rotation and the order of rotational symmetry of this 2-D shape?

- ○ Angle of rotation: 180 degrees
  Order of rotational symmetry: 1
- ○ Angle of rotation: 180 degrees
  Order of rotational symmetry: 2
- ○ Angle of rotation: 360 degrees
  Order of rotational symmetry: 1
- ○ Angle of rotation: 360 degrees
  Order of rotational symmetry: 2

[AB.9.PR.7]

Two students, Gayle and Jill, want to simplify the following expression.
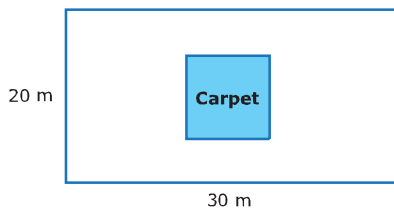
$$4(x^2 - 5x + 2) - (3x + 8)$$

	Gayle	Jill
Step 1	$= 4x^2 - 20x + 12 - (3x + 8)$	$= 4x^2 - 20x + 8 - (3x + 8)$
Step 2	$= 4x^2 - 20x + 12 - 3x - 8$	$= 4x^2 - 20x + 8 - 3x + 8$
Step 3	$= 4x^2 - 23x + 4$	$= 4x^2 - 23x + 16$

Who made the **first** error when simplifying the expression shown above?

- ○ Gayle in Step 1
- ○ Gayle in Step 2
- ○ Jill in Step 1
- ○ Jill in Step 2

[AB.9.N.3]

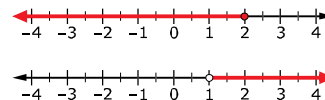A square carpet covers 37.5% of the floor area of a rectangular room.

What is the side length of the carpet?

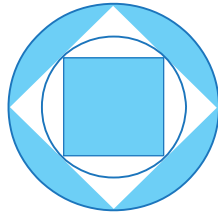- ○ 13 m
- ○ 14 m
- ○ 15 m
- ○ 16 m

[AB.9.PR.4]

An inequality is shown on each of the number lines.

Which expression represents the values, q, that are part of both inequalities?

- ○ $1 \le q \le 2$
- ○ $1 < q \le 2$
- ○ $1 \le q < 2$
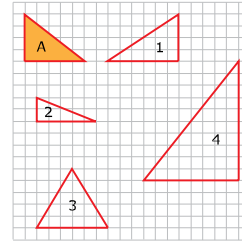- ○ $1 < q < 2$

[AB.9.SS.5]

How many lines of symmetry does the diagram shown above have?

☐ lines

[AB.9.SS.3]

Which triangle is similar to triangle A?

○ 1

○ 2

○ 3

○ 4

[AB.9.SPr.4]

A store manager placed a discount coupon into only one of three differently coloured boxes. A customer was selected at random and was asked to choose one of the boxes. The customer chose the blue box because blue is her favourite colour. On what was the customer's decision based?

○ Theoretical probability

○ Mathematical calculation

○ Subjective judgment

○ Experimental probability

[AB.9.SS.4]

In the diagram below, c represents the approximate distance across a circular cloud.
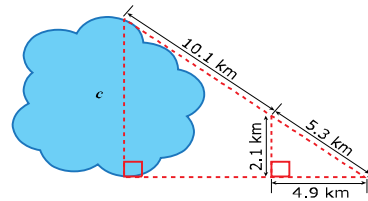
What is the approximate area of the cloud to the nearest square kilometre?

○ 6 square kilometres

○ 29 square kilometres

○ 48 square kilometres

○ 117 square kilometres

[AB.9.N.2]

If $(x^5)^2 \div x^8 = 196$, what is the value of x?

☐

[AB.9.PR.3]

The left and right sides of an equation are represented below. A legend for the equation is also given.

Legend

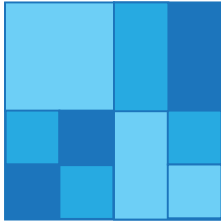|			
$= -x^2$	$= -x$	$= -1$	
$= x^2$	$= x$	$= 1$	

Left Side	Right Side

How can the solution to the equation be represented?

○ ▭ = ▭

○ ▭ = ▪

○ ▭ = ▭▭

○ ▭ = ▪▪▪

[AB.9.N.3]

The diagram is a square with a perimeter of 8 m. It consists of light blue, medium blue, and dark blue quadrilaterals.

What is the total area of the medium blue rectangle and the dark blue squares?

[ ] m²

[AB.9.SS.1]

A circular mirror is 26 cm in diameter and hangs by a decorative cord from a nail, as shown in the diagram below. The total length of the decorative cord is 14 cm. The lengths of cord on each side of the nail are equal to each other and form a tangent to the mirror. The diagram has not been drawn to scale.
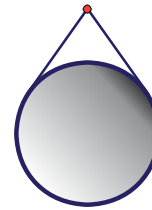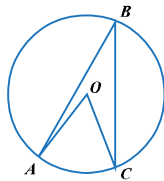
How far above the top of the circular mirror is the nail to the nearest tenth of a centimetre?

○ 1.8 cm   ○ 12.9 cm

○ 4.5 cm   ○ 14.8 cm

[AB.9.SS.1]

In the diagram below, the letter O represents the centre of the circle. The diagram has **not** been drawn to scale.

If the sum of $\angle AOC$ and $\angle ABC$ is 90 degrees, what is the measure of $\angle ABC$?

○ 60 degrees

○ 45 degrees

○ 30 degrees

○ 15 degrees

[AB.9.SPr.2]

Ricky and Fred play trumpet. They observe that 7 out of 10 of their fellow trumpet players have grey hair. Ricky concludes that of the 180 musicians in the regional symphony, 126 have grey hair. Fred believes that Ricky's conclusion cannot be supported by his observation. Which of the following statements best supports Fred's belief?

○ Ricky's probability calculation is incorrect.

○ Ricky did not use a proper questionnaire to obtain his data.

○ Ricky came to his conclusion too quickly.

○ Ricky's survey sample contains only trumpet players.

[AB.9.SS.2]

The following 3-D object is made of identical cubes. The volume of this 3-D object is 189 cubic metres.
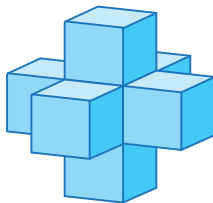
What is the surface area of the 3-D object?

○ 90 cu m

○ 270 cu m

○ 324 cu m

○ 378 cu m

[AB.9.N.2]

Which expression represents the addition of 8^2 and 8^3?

○ $(8 + 8)^{2 \times 3}$

○ $(8 + 8)^{2 + 3}$

○ $(8 + 8) \times (8 + 8 + 8)$

○ $(8 \times 8) + (8 \times 8 \times 8)$

[AB.9.N.5]

The square roots of two rational numbers are shown on the number line.

If point B is located on the number line between points A and C, which of the following could not represent B?

○ $\sqrt{\frac{289}{81}}$

○ $\sqrt{\frac{225}{16}}$

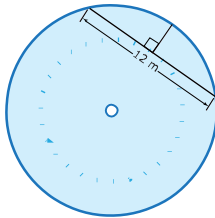○ $\sqrt{\frac{121}{36}}$

○ $\sqrt{\frac{169}{4}}$

[AB.9.N.3]

A keyboard has 60 keys, of which $\frac{1}{3}$ are grey, $\frac{1}{4}$ are black, and 7 are green. The rest of the keys are white. How many white keys does the keyboard have?

[AB.9.SS.1]

The diagram shows a swimming pool. The dots within the diagram represent floating buoys. The pool has a diameter of 20 metres.

What is the shortest distance from the buoys to the edge of the pool?
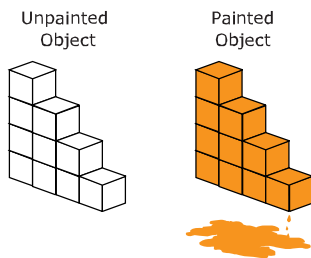
○ 8 m

○ 6 m

○ 4 m

○ 2 m

[AB.9.SPr.3]

Emily, Chelsea, and Alana donated some money to a charity. Emily donated three times as much as Alana. Chelsea donated $15 less than Alana. If the total amount they donated to charity is $75, how much money did Alana donate?

○ $3

○ $18

○ $25

○ $54

[AB.9.SS.2]

A 3-D object is made of cubes dipped in paint. Each cube is 2 cm x 2 cm x 2 cm.

Unpainted Object   Painted Object

If the painted object is separated into its individual cubes, what will be the total area of the unpainted surfaces?

○ 36 sq cm   ○ 96 sq cm

○ 40 sq cm   ○ 144 sq cm

[AB.9.PR.5]

Which pair of expressions are equivalent for all values of z?

○ $4z - 5z^2 + 3$ and $5z^2 - 3 + 4z$

○ $3 - 4z + 5z^2$ and $4z - 3 + 5z^2$

○ $3 + 5z^2 - 4z$ and $-5z^2 + 4z + 3$

○ $-4z + 3 + 5z^2$ and $3 + 5z^2 - 4z$

[AB.9.N.2]

The expression $\left(\frac{(a^4)^5}{a^{10}}\right)(a^{12} \div a^3 \times a^4)$ can be simplified to the form a^b.

What is the value of b?

- ○ 23
- ○ 21
- ○ 15
- ○ 8

[AB.9.PR.1]

Jesse completed an 8 km bicycle ride on his first day of training for a long-distance bicycle race. He increased the length of his next training rides by 2.5 km each time. Which of the following equations could be used to determine the distance, d, that Jesse rode on each training ride, r?

- ○ $d = 5.5 + 2.5r$
- ○ $d = 2.5 + 5.5r$
- ○ $d = 8r$
- ○ $d = 2.5r$

[AB.9.PR.1]

The relationship between two variables is given in the following equation.

$$40 + 23d = T$$

Which of the following situations could be represented by this equation?

- ○ The price of each main dish at a restaurant is $40, and the price of each dessert is $23.
- ○ A gymnastics school charges students $40 per class taken plus a $23 administration fee.
- ○ The plumber charges $40 per hour plus a $23 service fee.
- ○ The cost to rent a room at the recreation centre is a $40 administration fee plus $23 per hour.
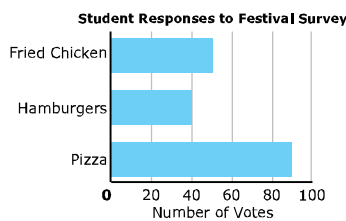
[AB.9.PR.3]

What is the value of x in the equation?

$$\frac{x}{4} + 2 = 34$$

[ ]

[AB.9.SPr.1]

The student advisory committee surveyed 180 out of 360 male students to determine which foods should be served at the school festival. The results of the survey are shown below.

Student Responses to Festival Survey

Fried Chicken

Hamburgers

Pizza

0   20   40   60   80   100
Number of Votes

What potential bias exists in the data collection for this survey?

- ○ The survey took too long to complete.
- ○ The students' cultural beliefs were not taken into account.
- ○ The sample does not represent the population.
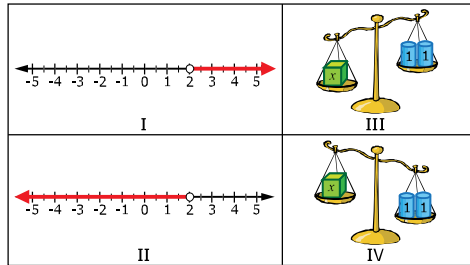- ○ The survey question is confusing.

[AB.9.N.5]

The squares in the grid are identical. The area of the shaded square is 16 units^2.
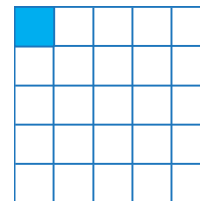
What is the perimeter of the grid?

[ ] units

[AB.9.PR.4]

I

III

II

IV

Which two diagrams shown above **both** represent the inequality $x < 2$?

- I and II
- II and IV
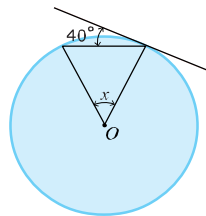- II and III
- III and IV

[AB.9.N.1]

Which of the following sets of powers is arranged in order of increasing value from left to right?

- $(-2)^2, (-3)^2, -2^2, -3^2$
- $-3^2, -2^2, (-2)^2, (-3)^2$
- $-3^2, (-3)^2, -2^2, (-2)^2$
- $(-2)^2, -2^2, (-3)^2, -3^2$

[AB.9.SS.1]

The following diagram has **not** been drawn to scale. The letter O represents the centre of the circle.

If the line shown is tangent to the circle, what is the measure of angle x?

- 80 degrees   - 60 degrees
- 40 degrees   - 20 degrees

[AB.9.N.4]

Justin is going to buy a used car for $850 (including GST). He can choose between two payment plans.

Plan A Pay $150 now and $25 each month
Plan B Pay $400 now and $45 each month

How many **fewer** payments could Justin make if he chooses Plan B?

- 28
- 18
- 13
- 10

[AB.9.N.4]

Two different expressions are simplified below.

Expression A	Expression A
$(2^3)^2 + 5^2 - 5^2 \times (-4)^2$	$3^6 \div 3^3 + (-4^2) \times 2$
$= 2^6 + 5^2 - 5^2 \times (-4)^2$	$= 3^2 + (-4^2) \times 2$
$= 64 + 25 - 25 \times 16$	$= 9 + (-16) \times 2$
$= 64 + 25 - 400$	$= 9 - 32$
$= -311$	$= -23$

Which of the following statements about the simplifications shown above is true?

- The simplification of Expression A is correct, and the simplification of Expression B is incorrect.
- The simplification of Expression A is incorrect, and the simplification of Expression B is correct.
- The simplifications of both expressions are incorrect.
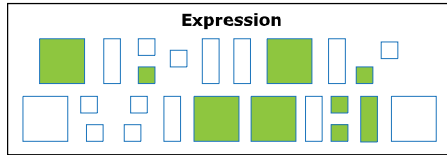- The simplifications of both expressions are correct.

[AB.9.N.3]

How many whole numbers could represent the value of z in the following inequality statement?

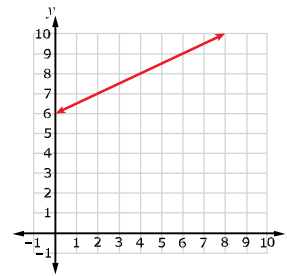$$\frac{1}{2} < \frac{5}{z} < 0.75$$

[AB.9.PR.6]

Legend

$\square = -x^2$ $\square = -x$ $\square = -1$

$\blacksquare = x^2$ $\blacksquare = x$ $\blacksquare = 1$
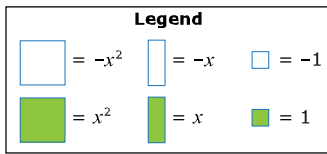
Expression

Which of the following could be added to the expression shown above to result in a sum that contains only a constant term?

○ $2x^2 - 5x + 14$ ○ $-2x^2 + 7x - 3$

○ $2x^2 - 7x + 3$ ○ $-2x^2 + 5x - 9$

[AB.9.PR.2]

Where will the line $y = 3 + 2x$ intersect the line shown on the graph above?

○ (8, 10)

○ (4, 8)

○ (2, 7)

○ (0, 6)

[AB.9.PR.3]

What is the value of x in the following equation?

$$3(x + 4) - 15 = 54$$

○ 19

○ 29

○ 62

○ 121

[AB.9.SS.4]

The map below shows two different lakes in Alberta. Each lake is shown by an x. The two lakes are 1 000 km apart.
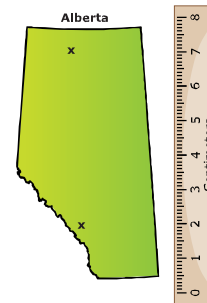
Which ratio represents the scale used to create the map?

○ 1 cm:20 km   ○ 1 cm:2 000 km

○ 1 cm:200 km   ○ 1 cm:20 000 km

[AB.9.SS.5]

Triangle ABC undergoes two different transformations.
Transformation 1: A 90-degree clockwise rotation about vertex A
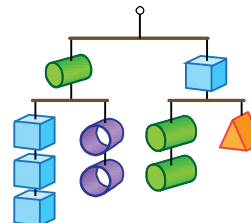Transformation 2: A translation 4 units left and 5 units up
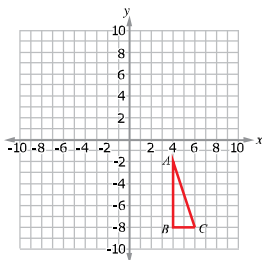
Which answer represents the ordered pair for each vertex after both transformations have been completed?

○ $A''(4, -2);\ B''(-2, -2);\ C''(-2, -4)$ ○ $A''(8, 3);\ B''(2, 3);\ C''(2, -4)$

○ $A''(8, 3);\ B''(14, 3);\ C''(14, 5)$ ○ $A''(0, 3);\ B''(-6, 3);\ C''(-6, 1)$

[AB.9.PR.3]

The following diagram represents a balanced mobile.

Which of the following equations correctly represents the relationship between some of the objects shown in the diagram above?

○

○

○

○

[AB.9.N.4]

Four students each simplified the following expression. The answers they found are shown below.

$$2 + 4 \times 5 - 7^3 \div (3 + 4)^2 \times 3$$

Student 1: 69
Student 2: 41
Student 3: 8
Student 4: 1

Which student simplified the expression correctly?

○ Student 1

○ Student 2

○ Student 3

○ Student 4

[AB.9.PR.7]

The quotient of $(-16x^2 + 32x) \div \otimes x$ is $-4x + 8$.
What is the value of $\otimes$?

[AB.9.N.3]

Three rational numbers are shown below.

$$A: -0.067$$

$$B: -\frac{13}{3}$$

$$C: -\frac{17}{4}$$

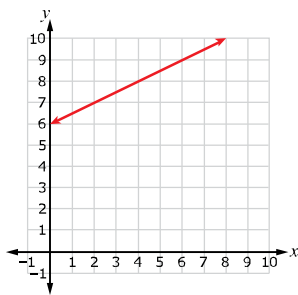Which inequality represents these rational numbers?

○ A < B < C

○ C < B < A

○ B < C < A

○ B < A < C

[AB.9.N.3]

Jeff's cellphone plan charges him $0.07 per text message, $0.09 per minute of voice usage, and a $4.00 base fee each month. What is Jeff's cellphone bill if he sends 44 text messages and talks for 53 minutes in one month?
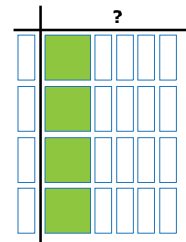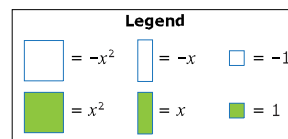
○ $11.67

○ $11.85

○ $17.86

○ $19.52

[AB.9.PR.2]

Which equation represents the linear relationship shown on the grid above?

○ $y = 0.5x + 6$

○ $y = 0.5x - 6$

○ $y = 2x + 6$

○ $y = 2x - 6$

[AB.9.PR.7]

Legend

$\square = -x^2$	$\square = -x$	$\square = -1$
$\blacksquare = x^2$	$\blacksquare = x$	$\blacksquare = 1$

A model of division is shown above on the right. Which of the following polynomials represents the unknown expression?

○ $4 - x^2$

○ $-x^2 + 4$

○ $4 - x$

○ $-x + 4$

[AB.9.SPr.1]

Conner conducts a survey to determine the demand for an animal shelter in his community. Conner can best minimize the bias in his survey by collecting data from what sort of people?

○ People who live in different communities

○ People who have pets

○ People who do not have pets

○ People who are different ages

[AB.9.PR.3]

Zoe wants to buy a new computer that costs $400, including GST. She already has $71 she plans to use towards buying the computer. Zoe earns $11.75/hour at her part-time job. What is the minimum number of hours that Zoe must work in order to save enough money to buy the computer?

[   ] hours