


Alberta Key 2018 Practice Test #1

1. Which of the following diagrams is the correct solution to the equation $-7 = -3x + 2$?

(A)

(A)  $x = 3$

B.  $x = -3$

C.  $x = -2$

D.  $x = 2$

Solve the equation:

$$\begin{array}{r} -7 = -3x + 2 \\ -2 \end{array}$$

$$\begin{array}{r} -9 = -3x \\ -3 \end{array}$$

$$3 = x$$

Use the following information to answer the next question.

Vivian has 14 fewer quarters than nickels.

2. If the total value of Vivian's coins is \$8.80, which of the following equations could be used to solve for the number of quarters that Vivian has?

A. $0.25x + 0.05(x - 14) = 8.80$

B. $0.05x + 0.25(x - 14) = 8.80$

C. $0.05x + 0.25(x - 14) = 8.80$

D. $0.25x - 0.05(x - 14) = 8.80$

Substitute

$$n = 0.05x$$

$$q = 0.25(n - 14)$$

• n

• ~~$q = 0.25n - 14$~~

• 8.80

• Set up the equation:

$$\begin{aligned} 8.80 &= n + q \\ &= n + (n - 14) \end{aligned}$$

$$\begin{aligned} 8.80 &= 2n - 14 \\ 8.80 &= 0.05x + 0.25(x - 14) \end{aligned}$$

Numerical Response

3. What is the value of x in the equation $2(x - 5) = -8x$? 1

Proof:

$$2(1 - 5) = -8(1)$$

$$2(-4) = -8$$

$$|-8 = -8|$$

$$2(x - 5) = -8x$$

$$\begin{array}{r} 2x - 10 = -8x \\ 8x \end{array}$$

$$10x - 10 = \text{then } x = 1$$

(B)

4. The solution of the inequality $18 + 12y \geq 15y$ is
- A. $y \geq 6$ B. $y \leq 6$
 C. $y \geq 2$ D. $y \leq 2$

$$18 + 12y \geq 15y$$

$$\begin{array}{r} -12y \\ -12y \end{array}$$

$$18 \geq \frac{3y}{3} \Rightarrow (6 \geq y)$$

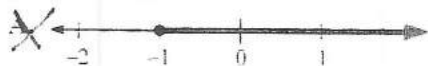
• Inequalities are solved just like equations

• the only exception: when multiplying or dividing by a negative number, Reverse the sign of the inequality

$$\therefore y \leq 6$$

(B)

5. Which of the following number lines represents the solution to the inequality $3m - 1 > -4$?



m is greater than -1

• $>$ indicates the 0 is open

(so A and C are out)

• Solve inequality

$$3m - 1 > -4$$

$$\begin{array}{r} +1 \\ +1 \end{array}$$

$$3m > \frac{-3}{3}$$

$$m > -1$$

Numerical Response

6. Solve $2x - 3 > 5$, and then identify which of the numbers -3, -4, -7, or 7 belongs to the solution set. _____

7

• Substitute each value and find out which makes the inequality true.





• $2(-3) - 3 > 5$	$-6 - 3 > 5$	$-9 > 5$ not true!
• $2(-4) - 3 > 5$	$-8 - 3 > 5$	$-11 > 5$ not true!
• $2(-7) - 3 > 5$	$-14 - 3 > 5$	$-17 > 5$ not true!

$$2(7) - 3 > 5 / 14 - 3 > 5 / 11 > 5 \text{ true}$$

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Substitute

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- ~~$q = 0.25n - 14$~~
- 8.80

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$$10x - 10 = \text{then } x = 1$$

(B)

4. The solution of the inequality $18 + 12y \geq 15y + 18$
- A. $y \geq 6$ B. $y \leq 6$
 C. $y \geq 2$ D. $y \leq 2$

$$18 + 12y \geq 15y + 18$$

$$\begin{array}{r} -12y \\ -12y \end{array}$$

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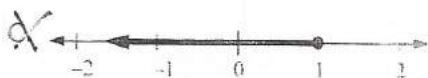
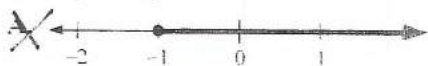
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$$\begin{array}{r} +1 \\ +1 \end{array}$$

$$\frac{3m}{3} > \frac{-3}{3}$$

$$(m > -1)$$

Numerical Response

6. Solve $2x - 3 > 5$, and then identify which of the numbers -3 , -4 , -7 , or 7 belongs to the solution set. 7

• Substitute each value and find out which makes the inequality true.

• $2(-3) - 3 > 5$	$-6 - 3 > 5$	$-9 > 5$ not true!
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• $2(-7) - 3 > 5$	$-14 - 3 > 5$	$-17 > 5$ not true!

$$2(7) - 3 > 5 / 14 - 3 > 5 / 11 > 5 \text{ true}$$

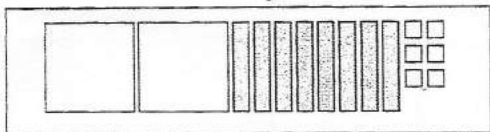
7. What is the constant term in the polynomial $2x + 3y + 2750$?

A. x B. 2750
C. 2 and 3 D. $2x - 3y$

• Constant Terms do not have a variable linked to it.

In $2x + 3y + 2750$ is the constant

Use the following information to answer the next question.



8. Which of the following polynomial expressions represents the given diagram?

A. $2x^2 - 8x + 6$
B. $2x^2 - 8x - 6$
C. $-2x^2 - 8x - 6$
D. $-2x^2 - 8x + 6$

$$\boxed{-x^2} \boxed{-x^2} = -2x^2$$

$$\begin{array}{cccccccc} x & x & x & x & x & x & x & x \\ \hline \end{array} = +8x$$

$$\begin{array}{ccc} -1 & -1 & -1 \\ \hline \end{array} = -6$$

Numerical Response

9. In the expression $2x - 5 + 3x + 2 + x + 6$, the sum of the numerical coefficients is _____.

Be careful
Coefficients are the integers attached to the variables

$$2x + 5 + 3x + 2 + x + 6$$

\downarrow \downarrow \downarrow
 2 3 1

10. Which of the following expressions is equivalent to the expression $(4x^2 + 3x - 9) - (2x + 2 + 6x^2)$?

A. $6x^2 + 5x - 7$
B. $6x^2 + 5x - 11$
C. $10x^2 + 5x - 7$
D. $10x^2 - 5x - 11$

you can only add "like" terms

$$\begin{array}{r} 4x^2 + 3x - 9 \\ 6x^2 + 2x + 2 \\ \hline 10x^2 + 5x - 7 \end{array}$$

notice how terms these are rearranged in descending order

when dividing \rightarrow Resulting polynomial has smaller degree

11. What is the simplified form of $(4x + 3y) - (2x - 4y)$?

A. $2x + 7y$ B. $2x - 7y$
C. $2x - y$ D. $2x + y$

$$\begin{array}{r} 4x + 3y \\ - (2x - 4y) \\ \hline 4x + 3y - 2x + 4y = 2x + 7y \end{array}$$

12. What is an equivalent form of the expression $\frac{2x^2 - 3x}{x}$?

A. $x - 2$ B. $x - 3$
C. $2x - 3$ D. $2x + 3$

$$\frac{2x^2}{x} - \frac{3x}{x} = \frac{2x \cdot x}{x} - \frac{3x}{x} = 2x - 3$$

Adding Polynomials

To subtract ADD the opposite

C 13.

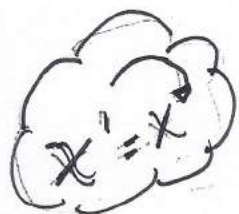
13. The expression $(2x)(5xy)(3y)$ is equivalent to

A. $10xy^2$

B. $10x^2y^2$

C. $30x^2y^2$

D. $150x^2y^2$



Remember that to multiply Powers:

• Make sure they have the same base.

$(2x)(5xy)(3y)$

Numbers with numbers
Letters with letters

$\rightarrow 2 \times 5 \times 3 = 30$

$\rightarrow x^1 \cdot x^1$ (When multiplying \rightarrow ADD the exponents)
 $x^1 \cdot x^1 = x^2$

$\rightarrow y^1 \cdot y^1 = y^{1+1} = y^2$

$\therefore 30x^2y^2$

C 14.

14. When the expression $3y - 4x - 6$ is multiplied by $-5x$, the result is

A. $15xy - 20x^2 - 30x$

B. $15xy - 20x^2 + 30x$

C. $-15xy + 20x^2 + 30x$

D. $-15xy + 20x^2 - 30x$

$(3y - 4x - 6)(-5x)$

$\cdot (3y)(-5x) = -15xy$

$\cdot (-4x)(-5x) = 20x^2$

$\cdot (-6)(-5x) = 30x$

Multiplication of Polynomials

Same base

• When multiplying, Add the exponents

• Letters with letters/
numbers with numbers

$-15xy + 20x^2 + 30x$

15.

15. When $11p^5 + 12p^4 + 6p + 2$ is multiplied by $7q^2r^3$ the coefficient of q^2r^3 is 14

- Multiplication of Polynomials
- Letters with letters / numbers with numbers

Remember:

$2x - 5$

coefficient → variable
→ constant

$$(11p^5 + 12p^4 + 6p + 2) \quad (7q^2r^3)$$

$$11 \cdot 7 \cdot p^5 q^2 r^3 + 12 \cdot 7 \cdot p^4 q^2 r^3 + 6 \cdot 7 p q^2 r^3 + 2 \cdot 7 q^2 r^3$$

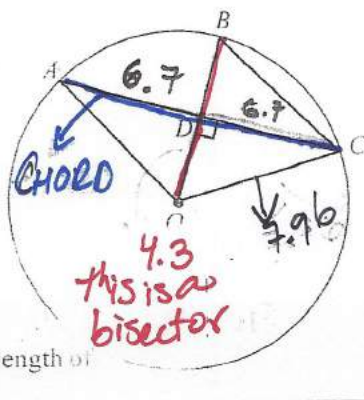
$$77p^5q^2r^3 + 84p^4q^2r^3 + 42p^3q^2r^3 + 14q^2r^3$$

Coefficient is

16.

Use the following information to answer the next question.

The length of line segment $OD = 4.3$ units, and the length of chord $AC = 13.4$ units.



4.3
6.7 C

This is the hypotenuse

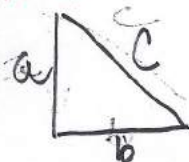
$$\overline{OC} = \sqrt{(4.3)^2 + (6.7)^2}$$

$$OC = \sqrt{63.38} = 7.96$$

- Notice that \overline{OC} is a Radius
- Also $\overline{OB} = \overline{OC} = \text{Radius} = 7.9\text{m}$

$$7.96 - \overline{BD} + \overline{OD} \Rightarrow \overline{BD} = 7.96 - 4.3$$

$$7.96 = \overline{BD} + 4.3 \Rightarrow \overline{BD} = 3.66$$



$$C = \sqrt{a^2 + b^2}$$

$$a = \sqrt{c^2 - b^2}$$

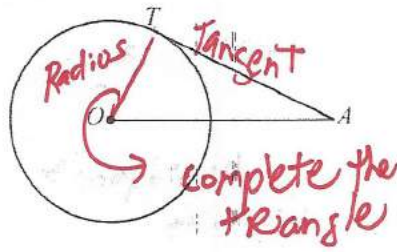
$$b = \sqrt{c^2 - a^2}$$

5. Rounded to the nearest tenth, the length of line segment BD is

A. 3.7 units B. 8.0 units

Use the following information to answer the next question.

O is the centre of the given circle, and AT is tangent to the circle at point T. The length of AT is 10 units.



17. If the radius of the circle is 5 units, then the length of OA is

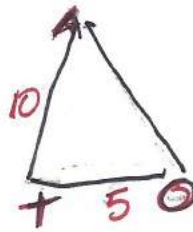
- A. 10 units
B. $5\sqrt{3}$ units
C. $5\sqrt{5}$ units
D. 15 units

Remember: Always make a triangle

• Notice that
 $OT = \text{Radius}$

• Now:
See how 11.18 is not an answer?

→ A is incorrect
D can be eliminated



$OA = \text{hypotenuse}$

$$\sqrt{10^2 + 5^2} = \sqrt{100 + 25}$$

$$\sqrt{125} = 11.18$$

• With B or C → use your calculator

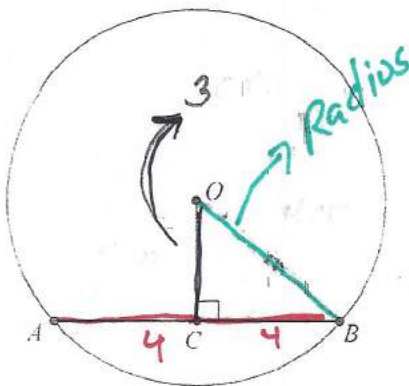
B. $5\sqrt{3} = 5 \times \sqrt{3} = 5 \times 1.73 = 6.73$

C. $5\sqrt{5} = 5 \times \sqrt{5} = 5 \times 2.23 = 11.18$

Use the following information to answer the next question.

18.

In a circle with centre O, AB is a chord and point C is a point on the chord.



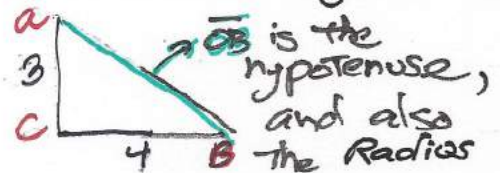
Numerical Response

18. If OC is perpendicular to AB, AB = 8 cm, and OC = 3 cm, determine the length of the radius of the circle. 5 cm

• $OC \perp AB = OC$ is the Perpendicular Bisector. = 3

$AB = \text{CHORD} = 8 \text{ cm}$

• If you make a Triangle

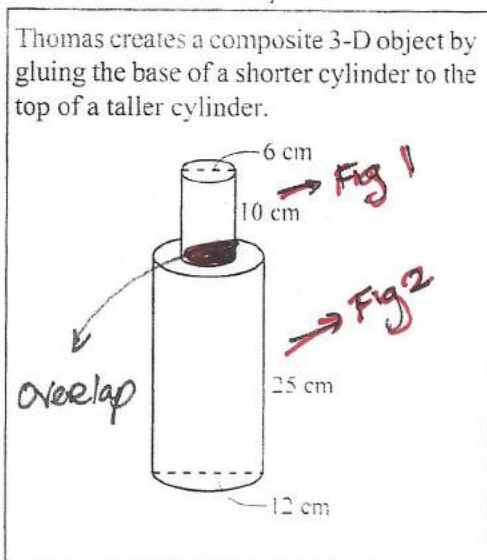


$$OB = \sqrt{3^2 + 4^2} = \sqrt{9 + 16}$$

$$OB = \sqrt{25} = 5 \text{ cm}$$

Always make a Triangle

Use the following information to answer the next question.



19. Using the value $\pi = 3.14$, what is the surface area of Thomas's object?
- A. 1111.48 cm^2 B. 1168.08 cm^2
 C. 1356.48 cm^2 D. 1412.00 cm^2

• **Fig 1**: Radius = 3 cm $h = 10$

• **cylinder**

↳ 2 circles + A
 2 circles + (circumference \times height)

Area Fig 1 =

$$2\pi r^2 + (2\pi r \times h)$$

$$2\pi(3)^2 + (2\pi(3) \times 10)$$

$$2\pi 9 + 60\pi = 18\pi + 60\pi$$

$$78\pi = \underline{244.92 \text{ cm}^2}$$

• **Fig 2**: also a **cylinder**

$$r = 6 \text{ cm } h = 25 \text{ cm}$$

$$= 2\pi r^2 + (2\pi r \times h)$$

$$= 2\pi(6)^2 + (2\pi(6) \times 25)$$

$$2\pi 36 + 300\pi = 72\pi + 300\pi$$

$$= 372\pi = \underline{1168.08}$$

• **Overlap**

$$\hookrightarrow 2\pi r^2 = 2\pi(3)^2$$

$$= 2\pi 9 = 18\pi = 56.52$$

• **Add the areas, subtract the overlap:**

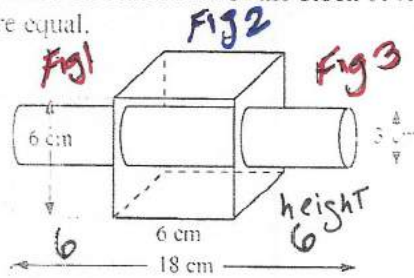
$$(\text{Fig. 1} + \text{Fig. 2}) - \text{Overlap}$$

$$244.92 \text{ cm}^2 + 1168.08 \text{ cm}^2 - 56.52 \text{ cm}^2$$

$$1413 \text{ cm}^2 - 56.52 \text{ cm}^2$$

$$\therefore SA = \underline{1356.48 \text{ cm}^2}$$

The Hôtel de Glace in Quebec uses a system similar to the one shown in the given diagram to dispense its drinks. A pipe carrying the liquid runs through a block of ice in order to cool it for the guests at the hotel. The lengths of the pipe, located on either side of the block of ice, are equal.



20. Rounded to a tenth of a square centimetre, how much insulation is needed to insulate the inside of the container used to hold the block of ice and pipes?

A. 113.0 cm² B. 201.9 cm²
C. 314.9 cm² D. 329.0 cm²

• Insulation means the object is completely covered

• Think about it as creating "Sleeves"

Fig 1 + Fig 2 + Fig 3
(no bottom circle) minus two circles (no bottom circle)

• Fig 1 → $r = 1.5, h = 6$
no circle bottom
 $\pi r^2 + (2\pi r \times h) = \pi(1.5)^2 + (2\pi(1.5) \times 6)$
 $2.25\pi + 18\pi = 20.25\pi$
→ $20.25\pi = 20.25(3.14) = 63.58 \text{ cm}^2$

• Notice that

Fig 1 = Fig 3

• Fig 2 → Cube with side length of 6 cm

• 6 faces

↳ each face has an area of $6 \times 6 = 36$

• total area is

$6 \times 36 \text{ cm}^2 = 216 \text{ cm}^2$

• But two circles must be cut out

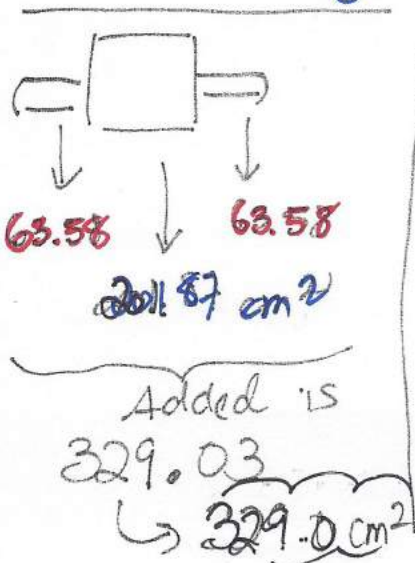
$2\pi r^2 = 2\pi(1.5)^2 = 4.5\pi$

$= 4.5(3.14)$

$= 14.13 \text{ cm}^2$

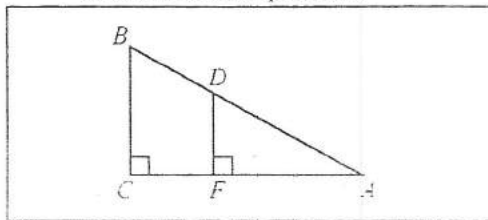
Area of Cube = $216 \text{ cm}^2 - 14.13 \text{ cm}^2$

Fig 2 = 201.87 cm^2



D

Use the following information to answer the next question.



21. Which of the following sets of ratios represent the three corresponding sides of the triangles?

A. $\frac{AC}{AD} = \frac{AB}{AF} = \frac{BF}{CD}$

B. $\frac{AF}{AD} = \frac{AB}{AC} = \frac{FD}{CB}$

C. $\frac{AC}{AF} = \frac{AB}{AC} = \frac{BF}{CB}$

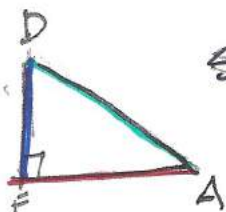
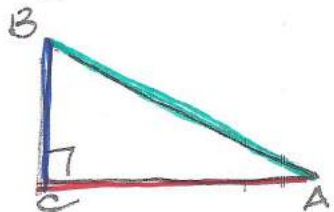
D. $\frac{AB}{AD} = \frac{AC}{AF} = \frac{BC}{DF}$

Similar Triangles

Be aware that to produce the correct Ratios (Scale factors)

you have to use the **Corresponding Sides** (equal sides)

- Identify the two individual Triangles



Same angles! Now determine the Ratio (Scale Factor)

Scale factor = $\frac{\text{New}}{\text{Old}}$

- Let's analyze the question's answers
are the Ratios formed with the correct corresponding sides)

BC and DF $\rightarrow \frac{BC}{DF}$

AC and AF $\rightarrow \frac{AC}{AF}$

AD and AB $\rightarrow \frac{AB}{AD}$

- Now check for the answer that has all

Similar triangles
↓
Same scale factor
OR
Same angles

22.

22. Which of the following statements about similar figures is true?

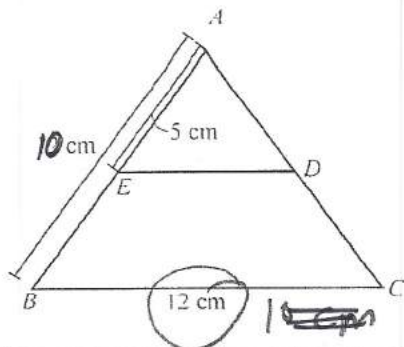
- A. Corresponding angles of similar figures are double in measure.
- B. Corresponding sides of similar figures are identical in measure.
- C. The ratios of the corresponding angles of similar figures are equal.
- D. The ratios of the lengths of corresponding sides of similar figures are equal.

- A. NOT TRUE \rightarrow angles are the same
- B. NOT TRUE \rightarrow corresponding sides mean they are the "same" leg on each of the triangles
- C. NOT TRUE \rightarrow Ratios are NOT of the angles (Don't apply to angles)
- D. Yes! the Ratios of the lengths of corresponding sides are equal

23.

Use the following information to answer the next question.

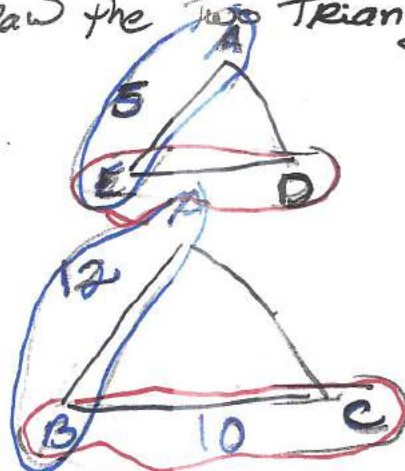
The given figure shows $\triangle ABC$. The lengths of sides AB and BC are 10 cm and 12 cm, respectively. Points E and D are positioned on sides AB and AC such that sides BC and DE are parallel. The length of side AE is 5 cm.



Numerical Response

23. What is the length of side DE? 6

• Draw the Two Triangles



• Set up the corresponding side Ratios

$$\frac{AB}{AE} = \frac{BC}{ED} \quad \bigg/ \quad \frac{10}{5} = \frac{12}{ED}$$

$$ED = \frac{12 \times 5}{10} = 60/10 = 6 \text{ cm}$$

Similar triangles
• Corresponding sides

Use the following information to answer the next question.

Sheldon is opening a new coffee shop and would like to know what types of desserts people prefer to have with their coffee. He is planning to send a small questionnaire to every home within a 15 km radius of the coffee shop.

24. The main problem with this type of data collection is
- A. cost
 - B. ethics
 - C. privacy
 - D. use of language

Cost! It's expensive to send so many questionnaires out.

ethics → Refers to the information gathered ~~and~~ being used for what it was collected

Privacy → Assuming these questions only refer to the preferred type of desserts, and it's anonymous, this should not be the issue

Use of language → Since we ^{don't} know what is on the survey we can't assume this is the issue.

Use the following information to answer the next question.

The Grade 6 student council at McKee School is trying to decide which desserts to sell at the school bake sale that will take place on the same afternoon as the Christmas concert. The students decide to create a questionnaire to survey a sample population about which types of desserts should be sold.

25. Which of the following sample populations will give the most relevant responses so that the student council can make the most appropriate decisions?
- A. Adults only
 - B. Students only
 - C. As many parents and teachers as possible
 - D. As many parents, teachers, and students as possible

Kind of the most logical

Use the following information to answer the next question.

26

Brianna and Lee are doing a survey to find the top five favourite television programs among Manitoba teenagers. To start, they compile a list of the most popular TV programs. Next, they plan to survey everyone in the lunch room of their junior high school during the noon hour. They will ask each student to select their five favourite television programs from a given list. They will repeat their survey every day for one week to make sure they include every student.

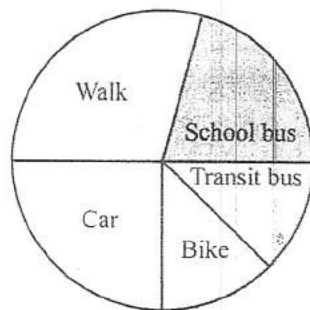
26. One reason their survey will **not** lead to valid results is that
- A. the population was not identified
 - B. the survey question is not simple or relevant
 - C. they may not have included an equal number of boys and girls
 - D. surveying students at one school may not reflect the opinion of the population

Since not all Manitoban teenagers go to that school, they are not really collecting information from the population.

27.

Use the following information to answer the next question.

The Grade 5 students at Midtown School were surveyed to see how they get to school. The results are shown in the given graph.



May, Melody, Deborah, and Amy each wrote two conclusions based on the data in the graph. They then indicated if their conclusions were true or false.

27. Which of the students correctly indicated if their conclusions were true or false?

A. May

The number of students riding in cars is the same as the number of students riding the school bus.	True
The number of students riding in cars is the same as the number of students biking and taking the transit bus together.	False

B. Melody

Half of the students walk or take the school bus.	False
There are more students taking the transit bus than the school bus.	True

C. Deborah

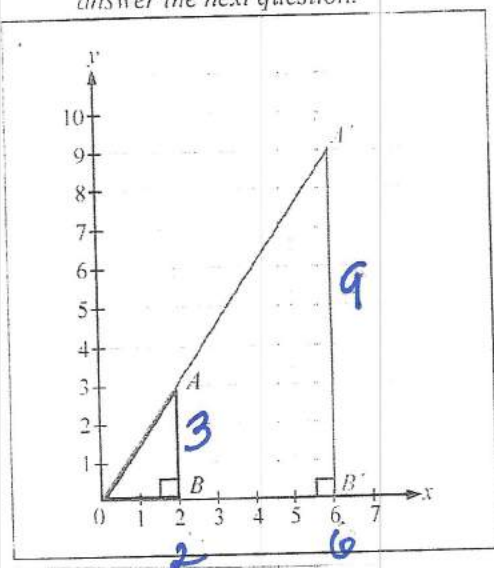
There are more students taking the transit bus than the school bus.	False
The number of students riding in cars is the same as the number of students biking and taking the transit bus together.	False

D. Amy

More than half of the students walk or take the school bus.	False
The number of students riding in cars is the same as the number of students biking and taking the transit bus together.	True

Use the following information to answer the next question.

(B) 28.



28. If the centre of enlargement is located at the origin, the scale factor that is used to transform $\triangle AOB$ into $\triangle A'O'B'$ is

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

- It is an enlargement, so $SF > 1$
- Remember: $SF = \frac{\text{New}}{\text{Old}}$

$$SF = \frac{\text{New}}{\text{Old}} = \frac{6}{2} = 3$$

$$\therefore SF = 3$$

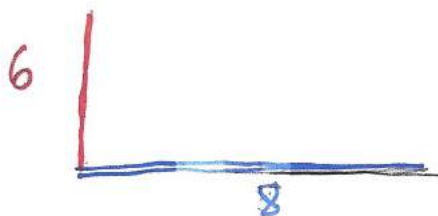
- Since all corresponding sides should have the same $SF \rightarrow 9/3 = 3$

(C) 29.

Use the following information to answer the next question.

At 11:30 A.M. on a sunny day, a 6-foot tall man casts an 8-foot long shadow.

29. The length of the shadow cast by a 45-foot high building at the same time is
- A. 33 ft
B. 47 ft
C. 60 ft
D. 85 ft



Make sure you use equivalent or corresponding sides

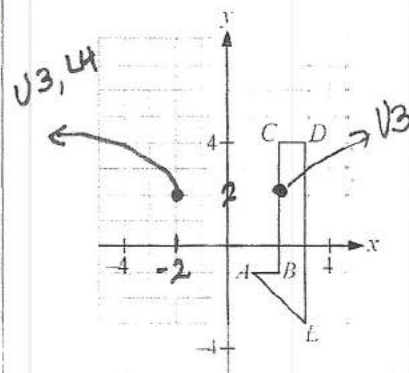


$$\frac{6}{45} = \frac{8}{x}$$

$$x = \frac{45 \times 8}{6} = \frac{360}{6} = 60 \text{ ft}$$

Use the following information to answer the next question.

Figure $ABCDE$ is plotted on a coordinate plane.



30. When the given figure is translated U3 and L4, the coordinates of B' will be
- A. $(-3, 2)$ B. $(-2, 2)$
C. $(2, -1)$ D. $(-1, 0)$

Translated 3 up
and 4 left

Results in $x = -2$
 $y = 2$

$\therefore (-2, 2)$

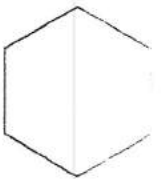
Which of the following figures does not have a line of symmetry?

A.



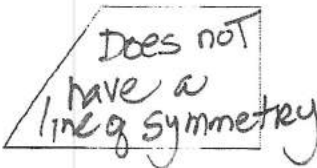
Has lines of symmetry

B.



Has lines of symmetry

C.



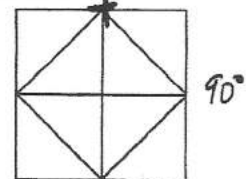
Does not have a line of symmetry

D.



Use the following information to answer the next question.

A tessellation is shown.



Numerical Response

32. The given tessellation has a rotational symmetry of order _____

Rotational symmetry refers to how many times a rotated figure matches the original

Matches at: $90^\circ, 180^\circ, 270^\circ$
and 360°

\therefore Rotational Symmetry

= 4

①

33. If $a^5 = 3^5$, simplify $(2a)^7$
 A. 3^7 B. 3^8
 C. 6^6 D. 6^7

If $a^5 = 3^5$
 then $a = 3$

• Substitute:

$$(2a)^7 = (2 \cdot 3)^7 = 6^7$$

∴ 6^7 is your answer

②

34

Miro purchases hockey cards when he visits card shows. To track the total number of cards he purchases, C , he uses the equation $C = 2^n - 1$, where n is the number of shows he has attended.

- 1 case stores 50 cards
- 9 card shows

NUMERICAL RESPONSE

34. Miro stores his cards in a case that can hold up to 50 cards. How many cases would he need to store all his cards after attending 9 card shows?

$$C = 2^9 - 1$$

$$= 512 - 1 = 511 \text{ Cards}$$

- To figure out how many

$$\text{Cases} = \frac{511 \text{ cards}}{50} = 10.22$$

∴ 10.22 Cases → 11 Cases

③ 35.

Simplified as a single power
 $5^3 \times 5^6 \times 5^4$ is
 A. 5^{13} B. 5^{12}
 C. 5^5 D. 5^{-1}

- Powers of equal bases
- to multiply

→ Add the exponents

$$5^3 \times 5^6 \times 5^4 = 5^{3+6+4} = 5^{13}$$

∴ 5^{13}

④ 36

simplify the expressions $3^4 \times 3^7 \div 3^2$ to a single power

A. 3^{13}

B. 3^8

C. 3^9

D. 3^7

BEDMAS → but multiplication and division are at same level → go from left to write

$$3^4 \times 3^7 \div 3^2 = 3^{11} \div 3^2 = 3^9$$

Numerical Response

37. Expression
 $(-4 \times (-2))^3 = 32768$

$$\begin{aligned} & \cdot (-2)^3)^3 \\ & \cdot -4^3 \end{aligned}$$

So: $-4^3 \times (-2)^9$
 $= -64 \times 512 = 32768$

2

Use the following information to answer the next question.

A fruit vendor buys some oranges at a rate of \$0.50 per orange. He buys an equal number of bananas at a rate of \$0.25 per banana. The vendor's profit on each piece of fruit he sells is double the purchase price. At the end of the day, all the fruit has been sold, and the vendor's total revenue was \$30.00.

38. How many oranges did the vendor sell?

- A. 10 B. 15
C. 20 D. 25

This is equal number of oranges and bananas

∴ 20 Oranges

Use the following information to answer the next question.

Matthias works as a plumber. He has a length of copper pipe measuring $6\frac{1}{2}$ m. He knows that his next job requires three separate lengths of pipe: $1\frac{1}{5}$ m, $2\frac{1}{2}$ m, and $2\frac{2}{5}$ m.

$$\frac{4}{10} = \frac{2}{5} \text{ m}$$

39. After Matthias cuts these pieces, how much of his original pipe will he have left?

- A. $\frac{1}{10}$ m B. $\frac{1}{5}$ m
C. $\frac{2}{5}$ m D. $\frac{3}{5}$ m

PROFIT

- Oranges: $0.50 \times 2 = \$1$
- Bananas: $0.25 \times 2 = \$0.50$

- Set up equation for the profit (Equal amount of fruits)
 $\$1.00 + \$0.50 = \$1.50$

- Set up the equality:

$$\begin{aligned} \$30.00 &= 20 \text{ units} \\ \leftarrow \$1.50 \end{aligned}$$

STRATEGY: MAKE ALL FRACTIONS

$$\left(\frac{13}{2}\right)^{\frac{5}{5}} = \frac{65}{10} \quad \text{HAVE A COMMON DENOMINATOR}$$

$$\begin{aligned} 6\frac{1}{2} &= \frac{13}{2} \text{ total wire} \\ 1\frac{1}{5} &= \frac{6}{5} \text{ one piece} \rightarrow \left(\frac{6}{5}\right)^{\frac{2}{2}} = \frac{12}{10} \\ 2\frac{1}{2} &= \frac{5}{2} \text{ second piece} \\ 2\frac{2}{5} &= \frac{12}{5} \text{ third piece} \end{aligned}$$

Make sure the denominator is the same

$$\begin{aligned} \left(\frac{5}{2}\right)^{\frac{5}{5}} &= \frac{25}{10} \\ \left(\frac{12}{5}\right)^{\frac{2}{2}} &= \frac{24}{10} \\ \frac{65}{10} - \left(\frac{12}{10} + \frac{25}{10} + \frac{24}{10}\right) &= \frac{65}{10} - \frac{61}{10} = \frac{4}{10} \end{aligned}$$

Use the following information to answer the next question.

John's teacher asked him to evaluate the following expression:

$$(3.8 - 5.8)^4 - (-3)^3 - 5.6 \times 4.9$$

40. Which of the operations in the expression should John complete first?

- A. $(-3)^3$
B. $(-3)^3 - 5.6$
C. 5.6×4.9
D. $(3.8 - 5.8)$

Numerical Response

41. The lowest number of calculator keystrokes that can be used to solve the expression $21.4 \times (64.1 - 37.8)$ is 18.

42. Which of the following numbers is a perfect square?

- A. 209 B. 1 000
C. 1 524 D. 1 764

43. Which of the following square roots is a rational number?

- A. $\sqrt{1}$ B. $\sqrt{12}$
C. $\sqrt{48}$ D. $\sqrt{75}$

44. Using perfect squares, what is a reasonable estimate of the square root of 45?

- A. 6.0
C. 6.7
B. 6.3
D. 7.0

45. What is the estimated square root of 93?

- A. 8.5
C. 9.6
B. 9
D. 10

BEDMAS

↓

Brackets is First!

• $(3.8 - 5.8)$ is first

In the calculator...

2 1 . 4 × (6 4 . 1 - 3 7 . 8) =

↓

Don't count this

Use your calculator → Perfect squares have whole numbers as square

Roots

• $\sqrt{209} = 14.45$ NOT

• $\sqrt{1000} = 31.62$ NOT

• $\sqrt{1524} = 39.03$

then $\sqrt{1764} = 42$

$\sqrt{1} = 1$ ✓ integer

$\sqrt{12} = 3.464...$ non-Repeating non-Terminating

$\sqrt{48} = 6.928...$ non-Repeating non-Terminating

$\sqrt{75} = 8.6602...$ non-Repeating non-Terminating

$\sqrt{45}$ between 6 and 7

• Between 6 and 7
• higher than 6.5 since it is closer to 7.

• 7. Can't be 6. Can't be 6.3 → too low

not this →
close
Too high

Use the following information to answer the next question.

Yolanda begins working at a farm at a starting wage of \$15/h. Every two months, Yolanda's hourly wage will increase by \$0.80/h. Yolanda asks four friends to help her calculate the number of months, n , it will take before she earns \$21.40/h. The equations and answers generated by each friend are given in the chart.

Friend	Equation	Number of Months
Jill	$W = 0.80n + 15$	8
Sasha	$W = 0.40n + 15$	16
Jasmine	$W = 15.8n$	5
Rachel	$W = 15.4n$	6

46. Which of Yolanda's friends came up with the correct equation and the correct answer?

A. Jill
C. Rachel
B. Sasha
D. Jasmine

Month 1 \rightarrow 15
2 \rightarrow 15
3 \rightarrow 15.80
4 \rightarrow 15.80
5 \rightarrow 16.6
6 \rightarrow 16.6
7 \rightarrow 17.4
8 \rightarrow 17.4

• Looking at this, we can Discard 5, 6 and even 8 months

• the answer then is Sasha!

Use the following information to answer the next question.

Tony scores x marks on an examination. Ronald, ranked first in the class, scores 42 marks more than Tony. The sum of Tony and Ronald's marks is 140.

47. Which of the following equations can be used to determine the value of x ?

A. $x \times (x - 42) = 140$
B. $x + (x \times 42) = 140$
C. $(x + x) \times 42 = 140$
D. $x + (x + 42) = 140$

Tony = x

Ronald = $42 + x$
140

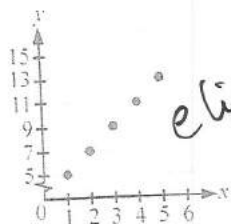
Set up equation:

$x + (x + 42) = 140$
Tony Ronald

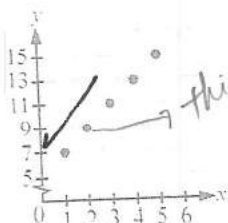
48

48. Which of the following graphs represents the linear relation $y = 2x + 5$?

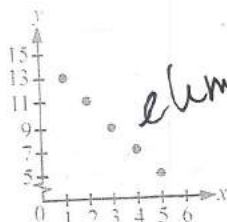
A.



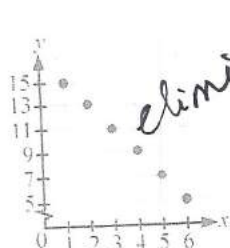
B.



C.



D.



Make a table of values
 $x = 2, 3, 4$

x	y = 2x + 5
2	2(2) + 5 = 9

Right off the bat,
 we can discard
 the graphs that
 DO NOT
 START AT $y = 5$

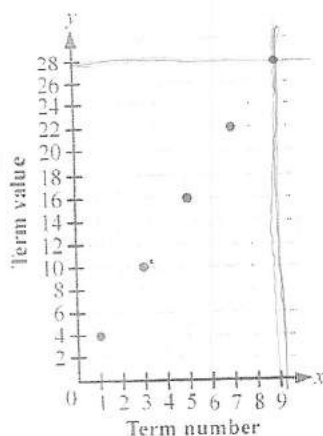
• just to
 make sure
 when $x = 2$

$$y = 2(2) + 5 = 9$$

49

(B)

The given graph shows term numbers and the corresponding term values for a particular pattern.



• term number is the x values

• According to the graph,
 when $x = 9$, then $y = 28$

49. In the given pattern, what is the term value when the term number is 9?

A. 22

B. 28

C. 20

D. 25