Grade 9 Math   2011 Sample Exam Questions
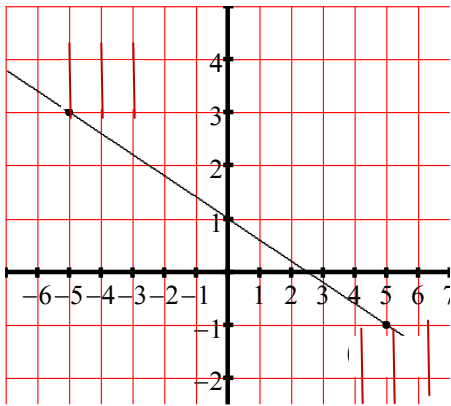
1. What is the equation of the line graphed below?

    (A) y = -5x + 1

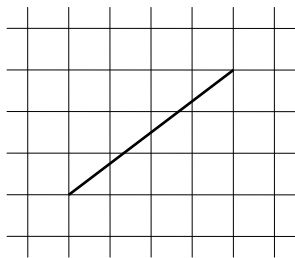   (B) y = 1

    (C) x = 1

    (D) y = $\frac{-2}{5}$ x + 1

2. Find the missing value of (-1, _?_) if y = -4x - 2.

    (A) 2   (B) -2   (C) -6   (D) 6

3. Find the missing value of (1, _?_) if y = 3x - 2.

    (A) 1   (B) 5   (C) -3   (D) 13

4. Which word best describes the line graphed below?

    (A) vertical   (B) horizontal

    (C) oblique   (D) discrete

5. If a horizontal line crosses the y-axis at 4, what is the equation of the line?

    (A) y = 4   (B) y = 4x   (C) x = 4   (D) x = 4y

6. Which line best represents the graph of the equation x = 1?

    (A)   (B)

    (C)   (D)

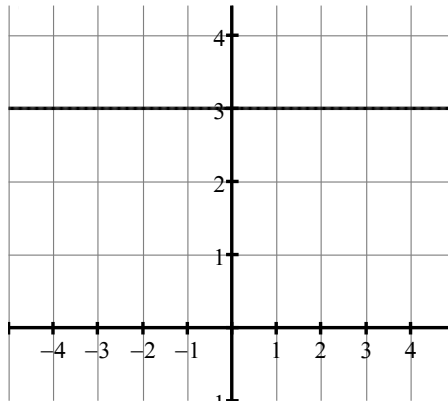7. If the dependent value decreases, which way would the line slant?

    (A)   (B)

    (C)   (D)

8. What is the equation of the line shown in the graph below?

    (A) *y = 3*   (B) *y = -3*
    (C) *x = 3*   (D) *x = -3*

9. What is the equation of the line shown in the graph?

   (A) x = 3

   (B) y = 3x

   (C) y = 3

   (D) x = 3y

10. This table provides three data points from a linear data set. Where would the line containing this data cross the y-axis?

    (A)   −3
    (B)   −1
    (C)   0
    (D)   11

x	⋯ 6 ⋯	8 ⋯	10 ⋯
y	⋯ 9 ⋯	13 ⋯	17 ⋯

11. The diagram below shows a path up, over and down a pattern of towers made with identical cubes measuring 1 unit by 1 unit by 1 unit. For the tower in this pattern that would be made with 25 cubes, how many units is the total path up over and down the tower?

    (A)   15
    (B)   16
    (C)   19
    (D)   23
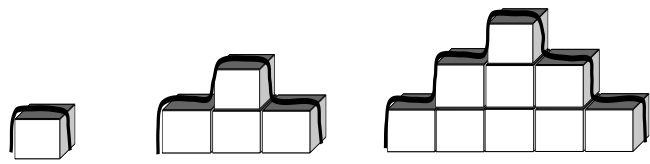
12. Which table represents a linear relation?

    (A)
x	0	1	2	3	4
y	1	3	9	27	81

    (B)
x	0	1	2	3	4
y	1	3	5	7	9

    (C)
x	0	1	2	3	4
y	1	3	5	3	1

    (D)
x	0	1	2	3	4
y	1	3	6	10	15

13. This graph represents profit per unit sold. What is the profit, in dollars, for sales of 500 units?

    Profit in Dollars

    (A)   200
    (B)   250
    (C)   750
    (D)   1000
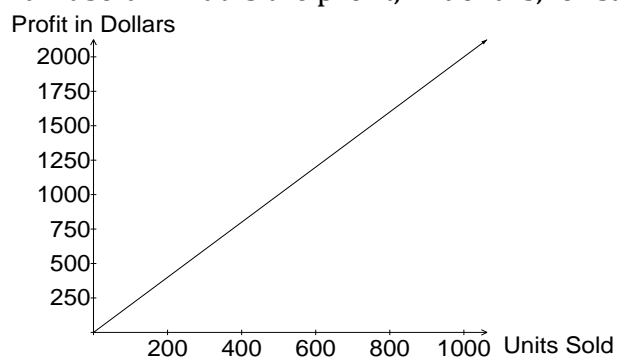
14. The table shows how the total number of diagonals a polygon has is related to the number of sides it has. If a polygon has 20 diagonals, how many sides would there be?

    (A)   8
    (B)   9
    (C)   10
    (D)   11

sides	diagonals
3	0
4	2
5	5
6	9

15. To print rolls of tickets, a company charges $25 as a set-up fee, and charges an additional $5 per roll of tickets. How many rolls of tickets can be printed for $200?

(A)　35　　　　　(B)　40　　　　　(C)　125　　　　　(D)　500

16. Given the diagrams shown, how many segments would be used to construct Diagram 15?
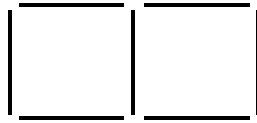

　　Diagram 1　　　　　　　Diagram 2　　　　　　　　　Diagram 3

(A)　15　　　　　(B)　46　　　　　(C)　59　　　　　(D)　60

17. At 6am, the temperature was $-11\,°C$. If the temperature increased at a constant rate of $3.2\,°C$ per hour, which represents the temperature, in ºC, at 12 noon?

(A)　$-11+9.2$　　　　　　　　(B)　$-11+7(3.2)$
(C)　$-11-19.2$　　　　　　　　(D)　$-11+3.2×6$

18. If the difference of consecutive y – values are constant and positive in a relationship, then the graph would be ___?

(A) linear　　　　(B) nonlinear　　　　(C) negative　　　　(D) none of the above

19. The cost, in cents **c**, to print and bind **n** copies of a manual is determined by the equation **c = 50 + 10n.** How many manuals could be printed at a cost of $7250?

(A) 10　　　　(B) 50　　　　(C) 170　　　　(D) 720

20. Which of the following ways is **not** a way to represent a relation?

(A)　variable　　　(B)　graph　　　(C) table of values　　　(D)　in words

21. A stone if dropped from a bridge. Its speed increases due to the force of gravity. If the speed, **s** in m/s, after **t** second is given by the formula $s = 9.8t + 3$, what is the speed of the stone at 5 seconds?

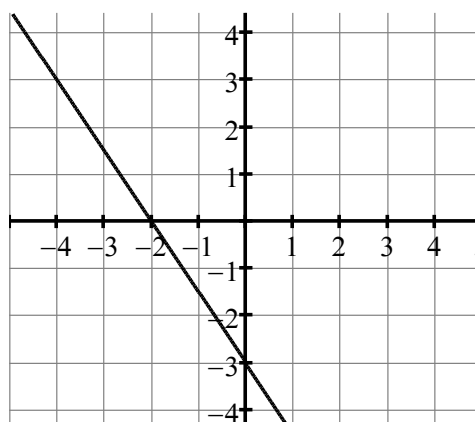(A)　0.2041　m/s　　　(B) 78.4 m/s　　　(C) 49 m/s　　　(D) 52 m/s

22. What is the equation of the line given in the diagram?
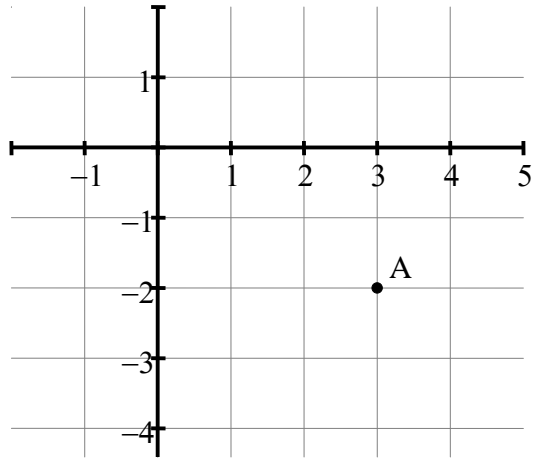
(A) $y = \dfrac{-3}{2}x + 3$

(B) $y = \dfrac{2}{3}x - 2$

(C) $y = \dfrac{-3}{2}x - 3$

(D) $y = \dfrac{-2}{3}x - 2$

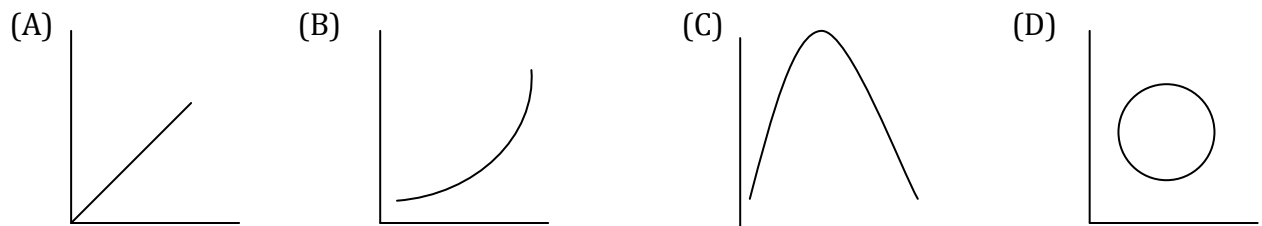23.   Which of the following points is represented in the graph?

(A) (2, 3)
(B) (-2, 3)
(C) (3, -2)
(D) (-3, -2)

24.   What is the equation of the y-axis?

(A) $x = 0$ (B) $y = 0$ (C) $x = 1$ (D) $y = 1$

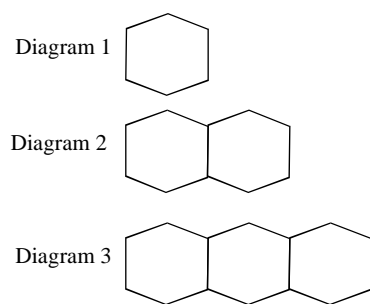25.   Which of the following represents a linear relation?

(A)   (B)   (C)   (D)

26.   Which equation best represents the relation, "the cost (C) is $2 per hour (t)."

(A) C = 2t   (B) t = 2C   (C) C = t ÷ 2   (D) C = 2

27.   The following diagrams were created with toothpicks. How many toothpicks would be needed to create the sixth diagram?
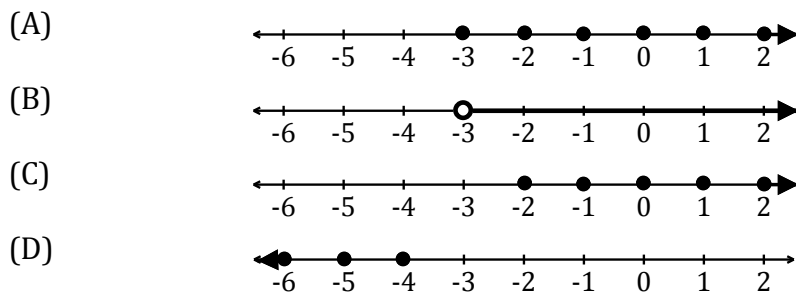
(A) 30
(B) 31
(C) 36
(D) 41

Diagram 1

Diagram 2

Diagram 3

28. In which step did the student make an error in their calculations?

A). Step 1

$$\frac{1}{6} + \frac{2}{9} \times 3$$

B). Step 2

$$\frac{3}{18} + \frac{4}{18} \times 3$$

C). Step 3

$$\frac{7}{18} \times 3$$

D). Step 4

$$\frac{21}{18} = \frac{7}{6}$$

29. Which graph represents the inequality $\{x | x > -3, x \in I\}$?

(A)

(B)

(C)

(D)

30. Which shows the set arranged from smallest to largest?
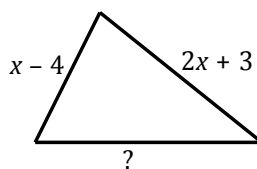
$$\left\{\frac{11}{4}, 2\frac{2}{3}, -5, -\sqrt{10}\right\}$$

(A) $\left\{-5, \quad -\sqrt{10}, \frac{11}{4}, \quad 2\frac{2}{3}\right\}$

(B) $\left\{-5, \quad -\sqrt{10}, \quad 2\frac{2}{3}, \frac{11}{4}\right\}$

(C) $\left\{-\sqrt{10}, \quad -5, \quad 2\frac{2}{3}, \frac{11}{4}\right\}$

(D) $\left\{\frac{11}{4}, \quad 2\frac{2}{3}, \quad -\sqrt{10}, \quad -5\right\}$

31. Write $[5^3 \times 5^5]^2$ as a single power.

(A) 5^{10} (B) 5^{16} (C) 5^{17} (D) 5^{30}

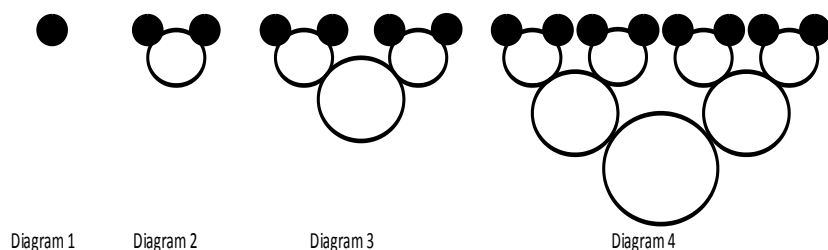32. If the perimeter of the triangle is $9x + 6$, what is the length of the third side?

(A) $6x + 5$
(B) $6x + 7$
(C) $12x + 5$
(D) $12x + 7$

33. What is the opposite of $3x - 2xy + 5y$?

(A) $-3x + 2xy - 5y$

(B) $-3x - 2xy + 5y$

(C) $3x + 2xy - 5y$

(D) $5y - 2xy + 3x$

34. How many shaded circles would exist in Diagram 7?

Diagram 1   Diagram 2   Diagram 3   Diagram 4

(A) 14   (B) 64   (C) 127   (D) 128

35. Given ΔXYZ ~ ΔRNM, which statement must be true?

(A) $\angle X = \angle N$ (B) $\angle Y = \angle N$ (C) $\overline{XY} = \overline{RM}$ (D) $\overline{YZ} = \overline{RN}$
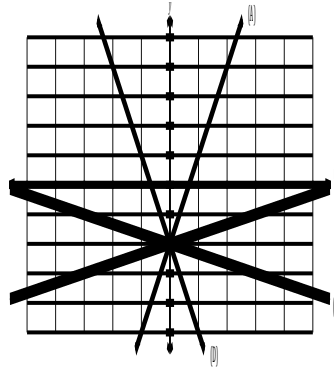
36. The table represents the height, in centimeters, of a plant each week. Which formula represents the plant growth?

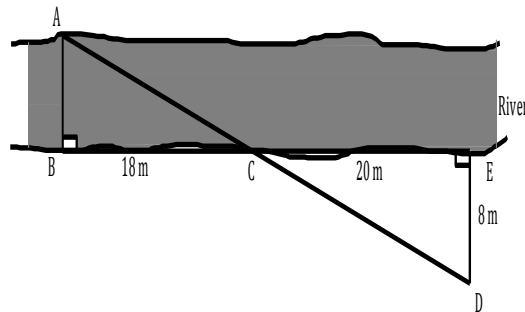| Time (t)	Height (h)
1	15
2	18
3	21
4	24
5	27

(A) $h = t + 3$

(B) $h = t + 14$

(C) $h = 3t + 12$

(D) $h = 15t$

37. Which line is described by the equation $y = 3x - 2$?

(A) A

(B) B

(C) C

(D) D

38. A surveyor made the measurements as shown in the diagram below. How wide is the river ($\overline{AB}$), in metres?

(A) 4.5   (B) 6.0   (C) 7.2   (D) 8.0

39. Which statement is true?

(A) If ΔABC ~ΔXYZ, then matching angles are equal.

(B) If ΔABC ~ΔXYZ, then matching angles are never equal.

(C) If ΔABC ~ΔXYZ, then matching sides are equal.

(D) If ΔABC ~ΔXYZ, then matching sides has a scale factor of 1.

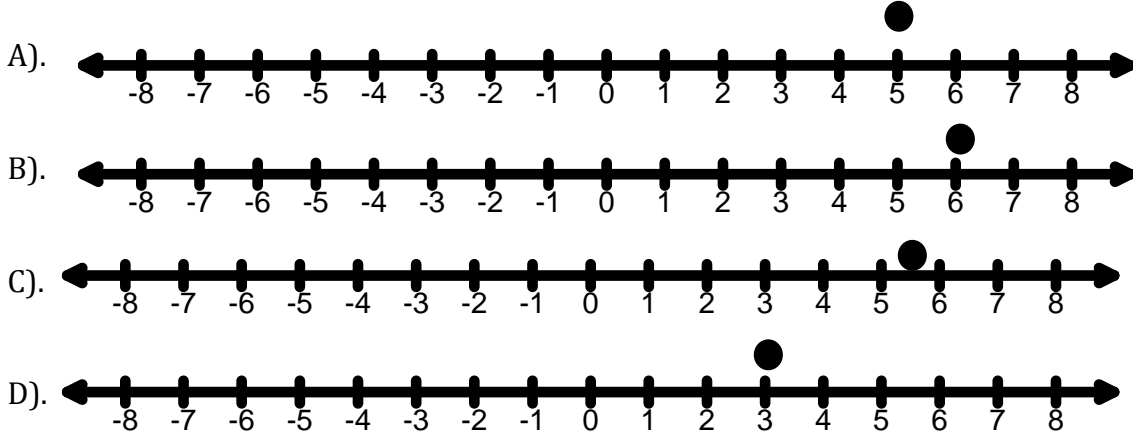40. Given the diagram as shown, what is the length of $\overline{PQ}$, in centimeters?

(A) 1.6

(B) 2

(C) 2.4

(D) 3
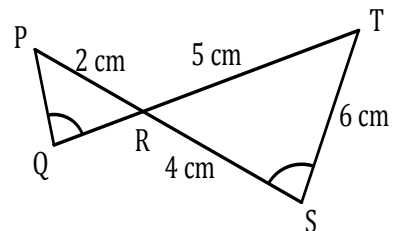
41. A point P (3, –5) is rotated 90° clockwise about the origin. What are the coordinates of the image point, P'?

(A) (–3, 5)

(B) (–3, –5)

(C) (5, 3)

(D) (–5, –3)

42. Which best represents $\sqrt{30}$?

A).

B).

C).

D).

43. Which number is irrational?

A). $-\sqrt{16}$ B). 17.43   C). $\sqrt{24}$ D). $5.\overline{67}$

44. Which operation should be performed first? $-1.5 \times \dfrac{-2}{3} + (-2.75 - \dfrac{1}{4})^2$

A). $-1.5 \times \dfrac{-2}{3}$ B). $\dfrac{-2}{3} + -2.75$ C). $-2.75 - \dfrac{1}{4}$ D). $\dfrac{1}{4}^2$

45.   What is $\dfrac{3^{10}}{3^2 \times 3^4}$ written as a single power ?

A). 3^{16} B). 3^{18} C). 3^4 D). 3^2

46.   Simplify: $(8a^2 + 2a - 3) - (- 6a^2 + 4a + 7)$

A). $2a^2 + 6a + 4$ B). $2a^2 - 2a - 10$ C). $14a^2 - 2a - 10$ D). $14a^2 + 6a + 4$

47.   Expand: $5x (2x + 3)$

A). $7x + 8$ B). $7x^2 + 15x$ C). $10x^2 + 15x$ D. $10x^2 + 8x$

48.   Using shaded as positive, which algebra tile diagram matches $2x (x + 1)$.

A).   B).   C).   D).
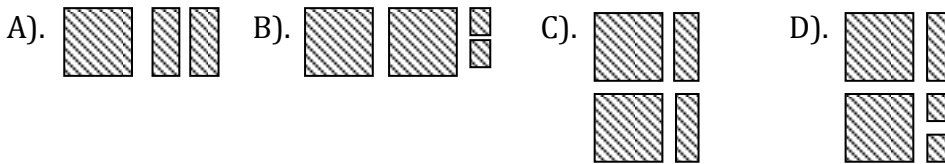
49. Simplify: $(- 28n^2 - 7n) \div 7n$

A). $- 21n^2 - 1$ B). $- 21n^2 - 14n$ C). $- 4n^2$ D). $- 4n - 1$

50.   Given the pattern in the table of values below, what is the value of y when x is 0?

x	...	3	6	9	12	...
y	...	8	14	20	26	...

A). 0   B). 2   C). 3   D). 8

51. What equation represents the table of values below?

A). $y = x + 1$

B). $y = x + 2$

C). $y = x + 4$

D). $y = x + 6$

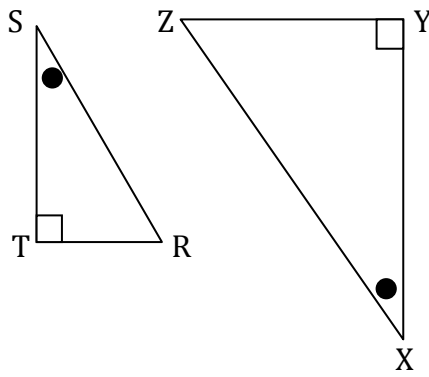| x	y
-2	2
-1	3
0	4
1	5
2	6

52. Given the diagram below, which statement is correct?

A). $\dfrac{ST}{YZ} = \dfrac{TR}{XY}$

B). $\dfrac{ST}{XZ} = \dfrac{TR}{YZ}$

C). $\dfrac{SR}{XZ} = \dfrac{TR}{YZ}$
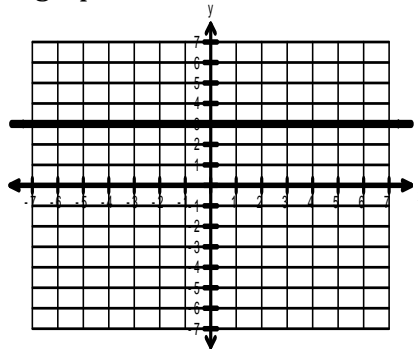
D). $\dfrac{SR}{YZ} = \dfrac{TR}{ZX}$

53. Which equation represents the graph of the line?
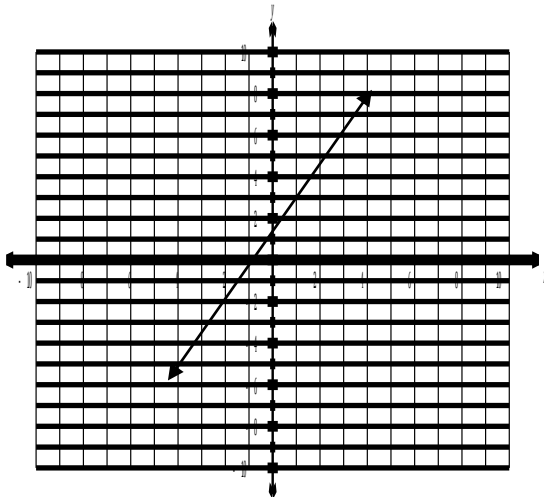
(A) $x = -3$
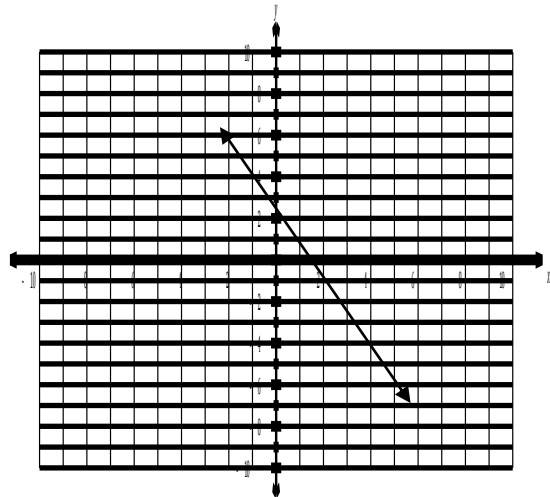(B) $y = -3$
(C) $y = 3$
(D) $x = 3$

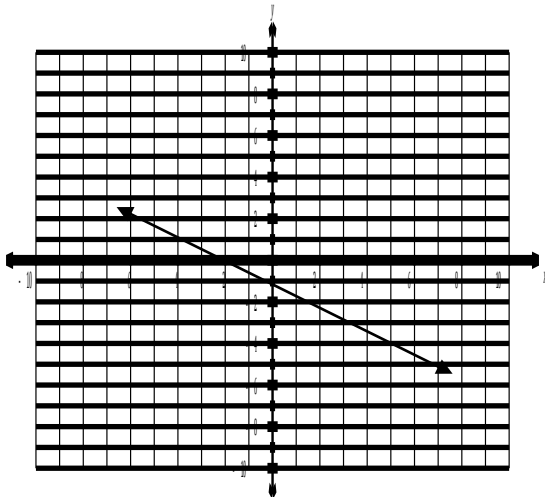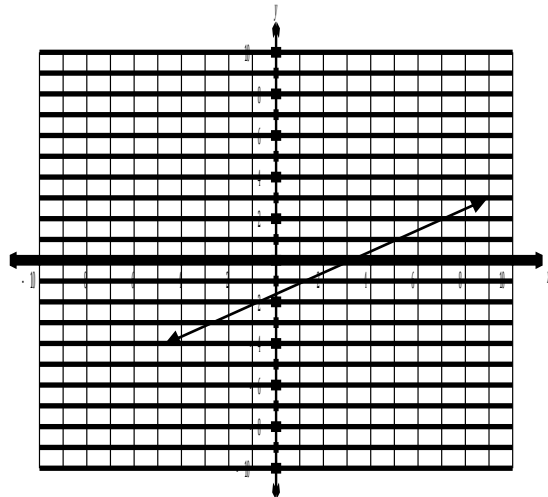54. Which graph represents the equation $2x + y = 2$?
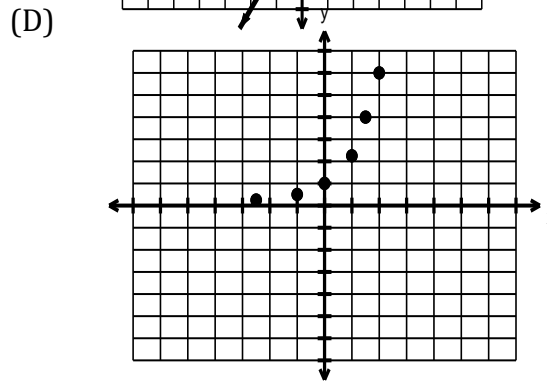
A).

B).

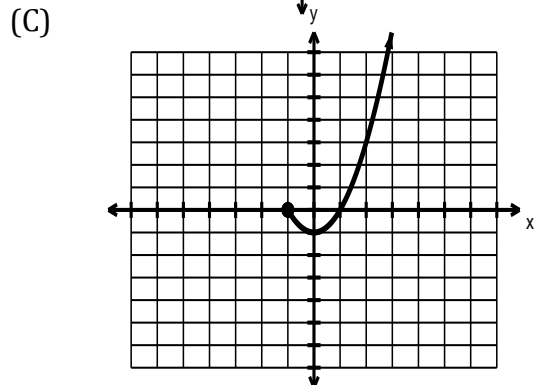C).

D).

55. Which equation models the table?

x	-2	-1	0	1	2
y	-9	-5	-1	3	5

(A) $y = x - 7$ (B) $y = x + 7$ (C) $y = 4x - 1$ (D) $y = -4x - 1$

56. Which graph represents a linear, discrete relation?

(A)

(B)

(C)

(D)
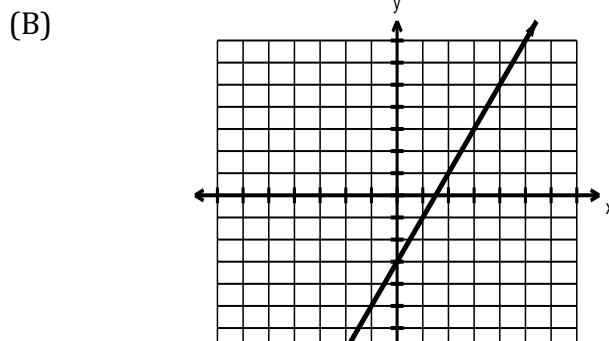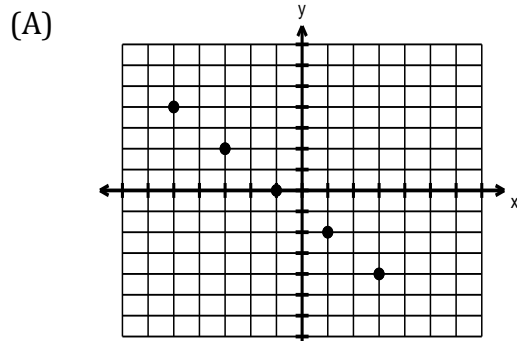
57. Solve the inequality: $-\dfrac{1}{2}x + 1 \leq -3$

(A) $x \geq 4$ (B) $x \leq 4$ (C) $x \geq 8$ (D) $x \leq 8$

58. Solve for x: $\dfrac{3}{4}(x - 4) = 6$

(A) $\dfrac{-40}{3}$ (B) -12 (C) 12 (D) $\dfrac{40}{3}$

59. On a hot sunny day teenagers on a beach were asked the following question: "Do you prefer hot or cold beverage?" In this survey, which of the following might lead to problems with the data collected?

(A)   Privacy   (B)   Timing   (C)   Ethics   (D) Use of Language

60. Which of these assumptions must you make when you say that the probability of rolling an even sum on two 6-sided dice is $\frac{1}{2}$?

(A)   The dice are the same size
(B)   The dice have the same numbers on them
(C)   The dice have the numbers from 1 to 6 on them.
(D)   The dice each have 3 even and 3 odd numbers on them

61. How many lines of symmetry does the Canadian flag have?

(A)   0
(B)   1
(C)   2
(D)   4

62. What is the order and angle of rotation symmetry for this figure?
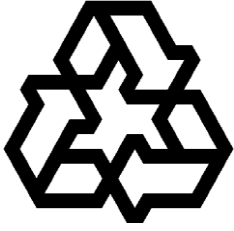
(A)   3, 60°
(B)   3, 120°
(C)   6, 60°
(D)   6, 120°

63. In which situation would it be best to survey a sample of the population?

(A)   Finding out the most popular TV reality show in Canada
(B)   Finding out the average age of teachers in a school
(C)   Finding out the favourite color in class
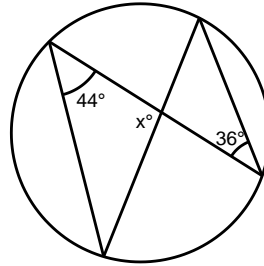(D)   Finding out the number of siblings of students in a class

64. In the circle with Centre O shown, what is the value of x?

(A)   80°
(B)   160°
(C)   200°
(D)   320°
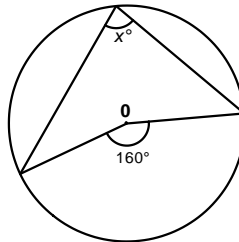
65. What is the value of x?

(A)   80°
(B)   92°
(C)   100°
(D)   108°

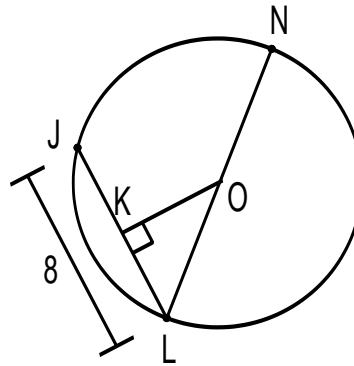66. In the circle with Centre O shown, point Q is a point of tangency. What is the measure of $\angle POR$?

(A)   54°
(B)   64°
(C)   108°
(D)   118°
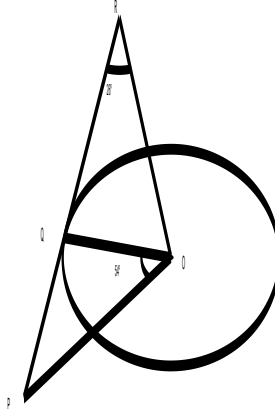
67. In the circle with Centre O shown, the diameter is 12 cm. What is the length of KO to the nearest tenth?
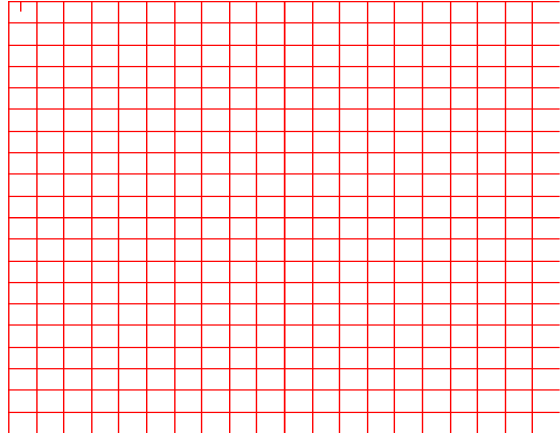
(A)   2.0
(B)   4.0
(C)   4.5
(D)   7.2

Part 2: Constructed Response

1. Graph the line y = -3x +1 using a table of values
    (Pick your own x-coordinates)

X	y

2. Solve: $3x - 8 = -2x + 7$.

3. Your school is planning a field trip to Gros Morne National Park. The cost of the trip is a flat fee of $500 plus $50 per student.
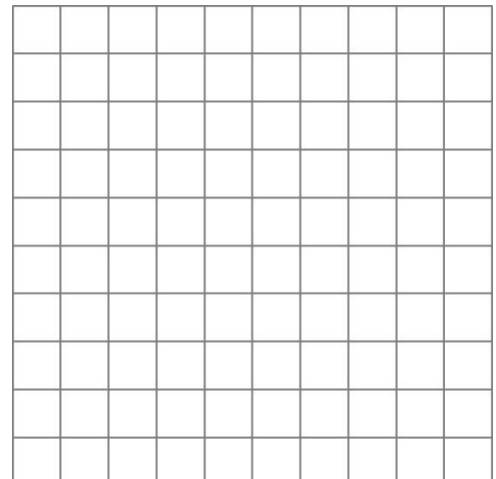
    a) Complete the table below.

    Table A:

| Number of Students	0	2	4	6	8
Cost of Trip					

    b) If the total cost of the trip was $1250, write and solve an equation to determine the number of students who went on the trip.

        c = cost of the trip
        n = number of students

    c) Graph the information from Table A and extend the graph to confirm your answer in (b). Label your graph.

4. Determine the area of the shaded region for the figure shown in simplest form.

$$x + 2$$

$$x + 1$$

$$x$$

$$x - 2$$
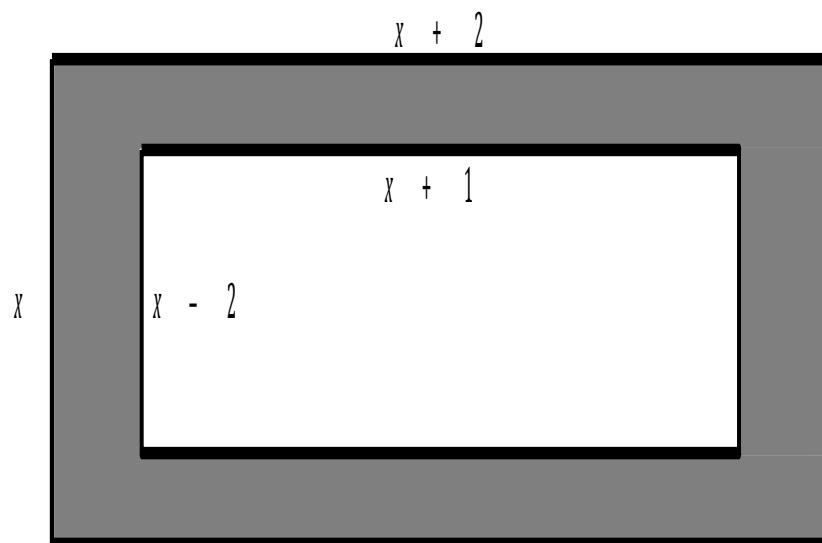
5. Continue the following pattern for one more drawing.
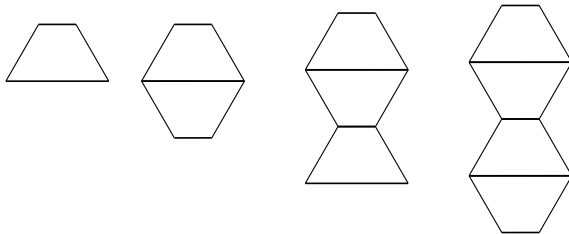
Diagram #
  One   Two   Three   Four

a) Complete the table for the given data.

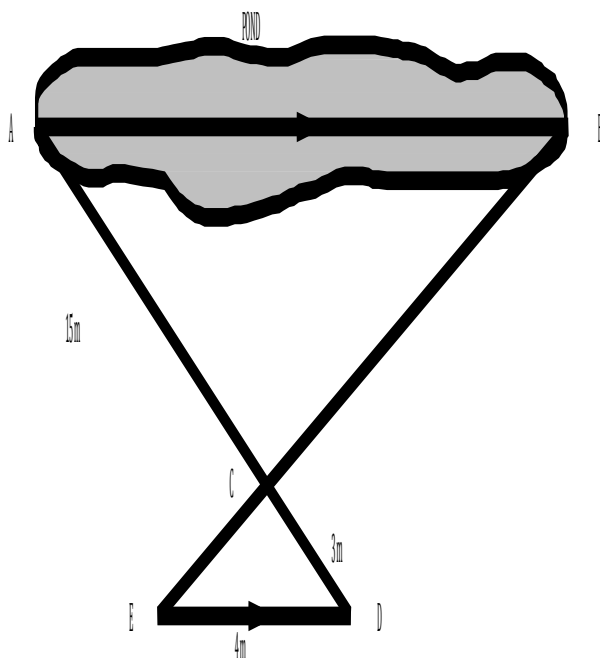| agram #	1					
# of line segments						

b) Graph the data.
BE CAREFUL TO LABEL THE AXIS CORRECTLY AND TO USE A PROPER SCALE.
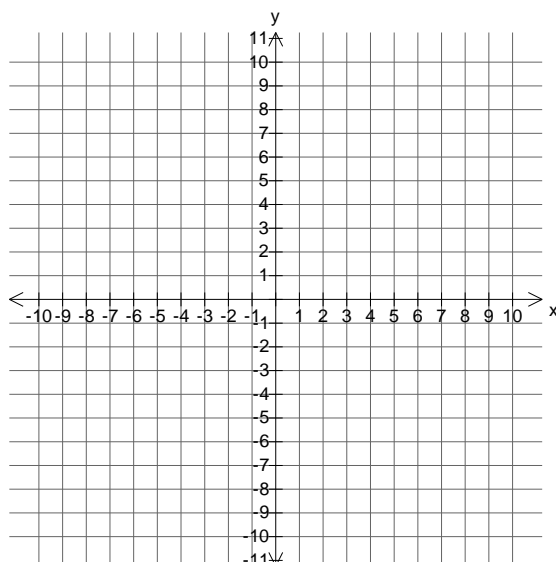
c)   Write an equation to represent the relation. Let **n = diagram #**   and
        s = # of sides.

6. Create and complete a table of values for the equation y = 2x + 4
    when x = -2, -1, 0, 1, 2.

7. Alice marked out the following triangles to determine the length of the
    pond, $\overline{AB}$.

    (A) Write a similarity relation.

    (B) Determine the length of the pond, $\overline{AB}$.
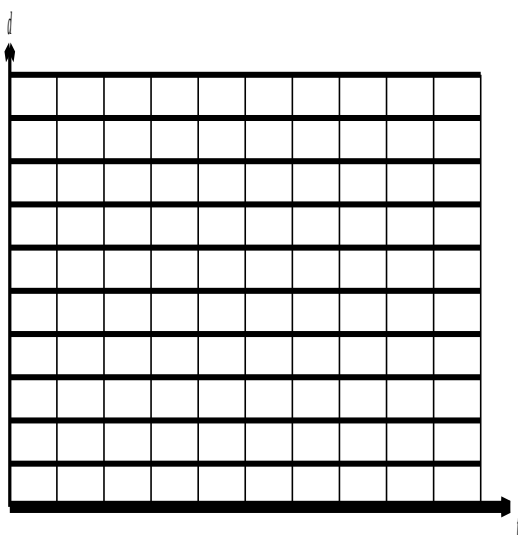
8. Sam walks toward a motion sensor.

    The distance from the sensor is determined by the equation $d = -2t + 8$

    where d represents distance in metres and t represents time in seconds.

    (A) Complete the table of values.

Time (s)	0	1	2	3	4
Distance (m)					

(B) Graph the information from the above table.

9.   Simplify: $(4x^2 - 5xy - 6y^2) - (8xy + 4y^2 + 5x^2)$

10.   Solve: $8x < 3x + 7$

11.   Solve: $2(x + 3) = -3x + 11$

12.   Calculate: $-2 + \frac{2}{3} \times 12$