Intermediate Mathematics
Provincial Assessment 2009

Last Name: _____   First Name: _____   MI: ____

Teacher: _____

School: _____   School District: _____

IMPORTANT

You will have to complete your name and school information in three places:
  (1) On this sheet (above)
  (2) On the bubble sheet
  (3) On the cover of your Student Booklet

Please ensure the information in each of these places in completed correctly and clearly. Your bubble sheet will be placed inside this Section 1 Insert for mailing. Pay particular attention that the bubble sheet and insert information are correct.

Section 1: Non-Calculator Section

You will need a pencil, paper, and ruler for this section. You are <u>not permitted the use of a calculator</u>.

Questions 1 to 7 require you to write, draw, or graph your responses in the space provided in this booklet. Do not use your bubble sheet for these questions. Section 1 should take about 20 minutes.

Your teacher will collect Section 1 when everyone is finished and will then give you Section 2.
You will need your bubble sheet for Section 3 only.

Section 1 Insert

_____

1.   Factor completely: $16xy^2 - 8x^2y$
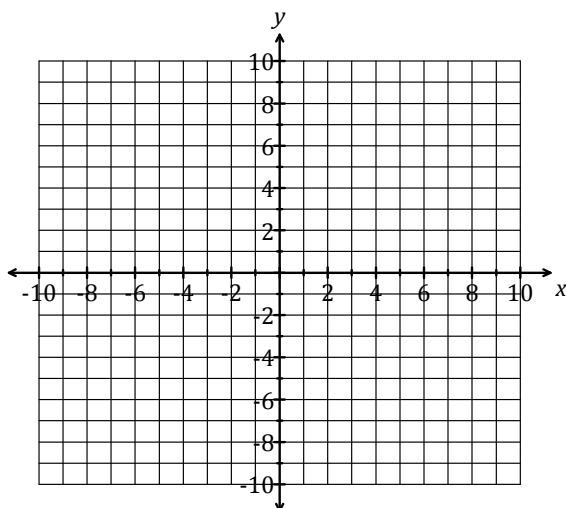
_____ out of 1 mark

2.   Calculate $(7.0 \times 10^7) \div (3.5 \times 10^{-5})$ expressing your answer in scientific notation.

_____ out of 1 mark

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

_____ out of 1 mark

_____

4.   Using the axes provided, graph the line having a slope of $-\dfrac{2}{3}$ and a y-intercept of 4.

__ out of 1 mark

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

__ out of 1 mark

_____

6.   Solve: $2(x + 3) - 3 = -3x + 8$

                                                                                    __ out of 1 mark

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

                                                                                    __ out of 1 mark

_____

Intermediate Mathematics
Provincial Assessment 2009

Last Name: _____   First Name: _____   MI: _____

Teacher: _____

School: _____   School District: _____

IMPORTANT

You will have to complete your name and school information in four places:
 (1) On Section 1 and 2
 (2) On the bubble sheet
 (3) On the cover of your Student Booklet

Please ensure the information in each of these places is completed correctly and clearly.

Section 2: Written Response Questions

You will need a pencil, paper, and ruler for this section. You are <u>permitted the use of a calculator</u>.

Questions, 8-11 require you to write, draw, or graph your responses in the space provided in this booklet. Do not use your bubble sheet for these questions. Section 2 should take about 20 minutes.

Your teacher will collect Section 2 when everyone is finished and will then give you Section 3 (a larger work booklet containing the rest of the questions). You will need your bubble sheet for Section 3.

Formulae

Volume of a Cone: $V = \frac{1}{3}\pi r^2 h$

Volume of a Sphere: $V = \frac{4}{3}\pi r^3$

Volume of a Cylinder: $V = \pi r^2 h$
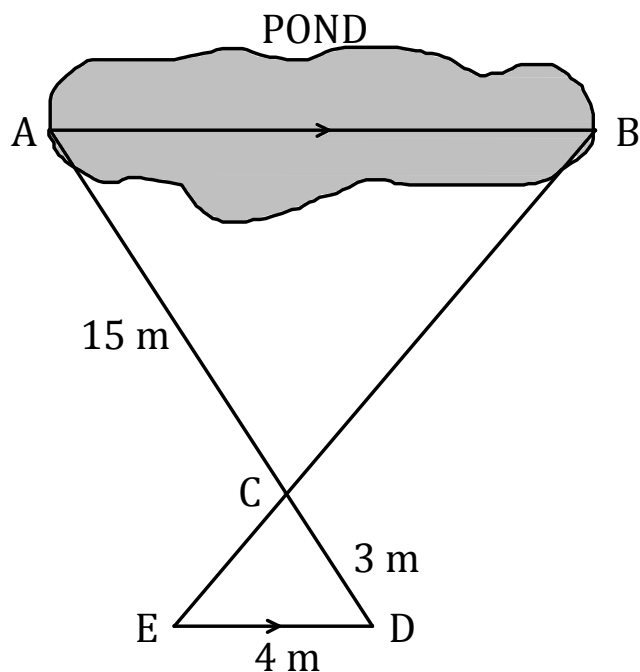
Surface Area of a Sphere: $SA = 4\pi r^2$

Surface Area of a Cone: $SA = \pi r^2 + \pi rs$

Slant Height of a Cone: $r^2 + h^2 = s^2$

Please note that all formulae may not be needed on any given assessment.

Section 2 Insert

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

POND

A · · · · · · · · · · · → B

15 m

C

3 m

E · · → D

4 m

(A)   Write a similarity relation.

(B)   Create and solve an equation to determine the length of the pond, $\overline{AB}$.

9. Sam walks toward a motion sensor.

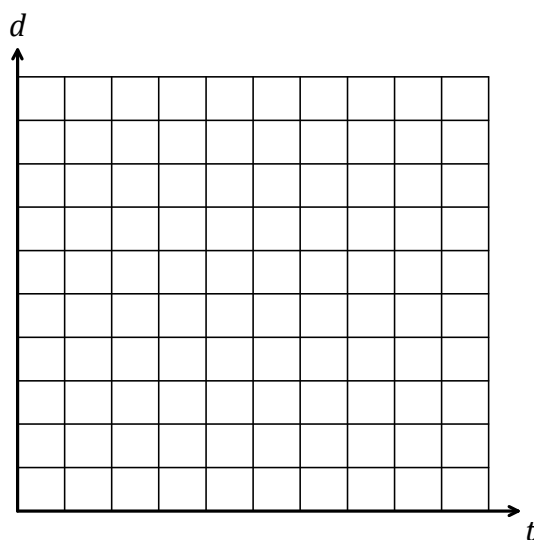   The distance from the sensor is determined by the equation

   $$d = -2t + 8$$

   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.

   d

   t

   (C)   What is the d-intercept and what does it represent?

   _____

   _____

   _____

   ___ out of 3 marks

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

$$x + 2$$

$$x + 1$$

$$x$$

$$x - 2$$
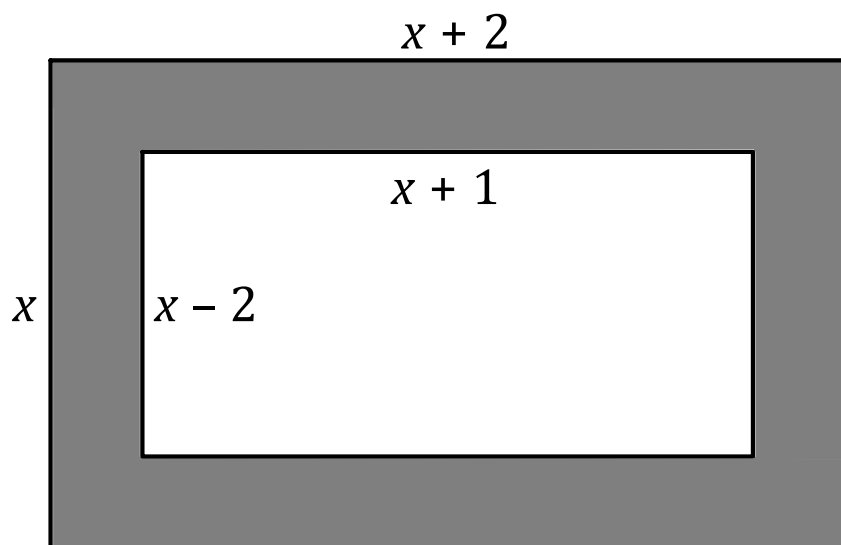
11. Wax is melted to form a cone-shaped candle with a radius of 8 cm and a height of 15 cm.
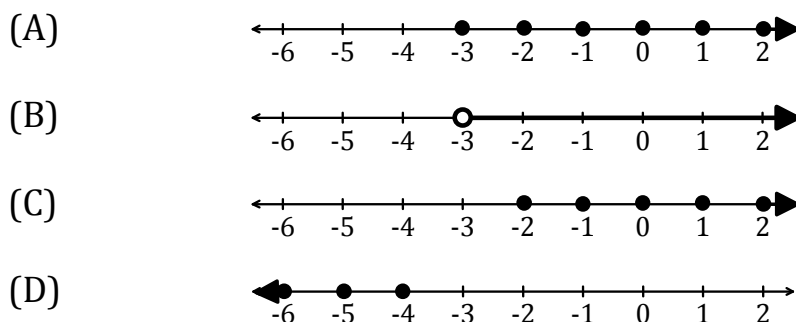
   (A)   Calculate the slant height.

h = 15 cm

slant height = ?

r = 8 cm
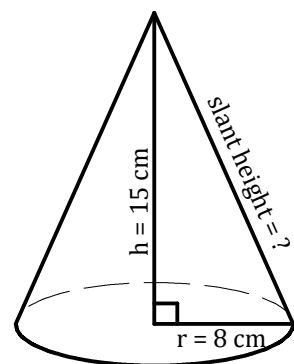
   (B)   Determine how much wrapping material is needed to completely cover the candle if there is no overlap (to the nearest cm^2). Use π = 3.14.

__ out of 3 marks

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

    (A)

    (B)

    (C)

    (D)

13. $-2\frac{3}{4}$ is a member of which two number sets?

    (A) Irrational, Integer

    (B) Rational, Integer

    (C) Real, Irrational

    (D) Real, Rational

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

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

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

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

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

15. A square has an area of 200cm². What are the lengths of each side, in centimetres, in simplest radical form?

    (A) $2\sqrt{10}$

    (B) $2\sqrt{50}$

    (C) $10\sqrt{2}$

    (D) $40\sqrt{2}$

16. Movie rentals are $1 for old releases and $2 for new releases. Which represents the total income for each type of movie during Friday and Saturday?

Number of Rentals

Old Releases	Comedy	Horror
Friday	125	75
Saturday	175	25

New Releases	Comedy	Horror
Friday	300	200
Saturday	400	300

    (A) $\begin{pmatrix} 425 & 275 \\ 575 & 325 \end{pmatrix}$

    (B) $\begin{pmatrix} 550 & 350 \\ 750 & 350 \end{pmatrix}$

    (C) $\begin{pmatrix} 725 & 275 \\ 575 & 325 \end{pmatrix}$

    (D) $\begin{pmatrix} 725 & 475 \\ 975 & 625 \end{pmatrix}$

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

  (A) 5^{10}

  (B) 5^{16}

  (C) 5^{17}

  (D) 5^{30}

18. Simplify: $\dfrac{a^3 \times a^{-2}}{a^7}$

  (A) $\dfrac{1}{a^{13}}$

  (B) $\dfrac{1}{a^6}$

  (C) a^6

  (D) a^8

19. 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) $12x + 7$

  $x - 4$ $2x + 3$

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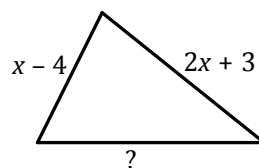
20. What is the opposite of $3x - 2xy + 5y$?

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

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

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

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

21. The area of a rectangle is $x^2 - 2x - 24$.
    What are the dimensions?

    (A) $(x + 4)$ by $(x - 6)$

    (B) $(x - 4)$ by $(x + 6)$

    (C) $(x + 4)$ by $(x + 6)$

    (D) $(x - 4)$ by $(x - 6)$

22. Expand and simplify: $(x - 5)(2x + 1)$

    (A) $2x^2 - 5$

    (B) $2x^2 - 4x - 5$

    (C) $2x^2 - 9x - 5$

    (D) $2x^2 - 11x - 5$

23. David walked to the store. The graph represents his distance from home over time. During what time interval is David walking the fastest?

    (A) A to B

    (B) B to C

    (C) C to D

    (D) D to E
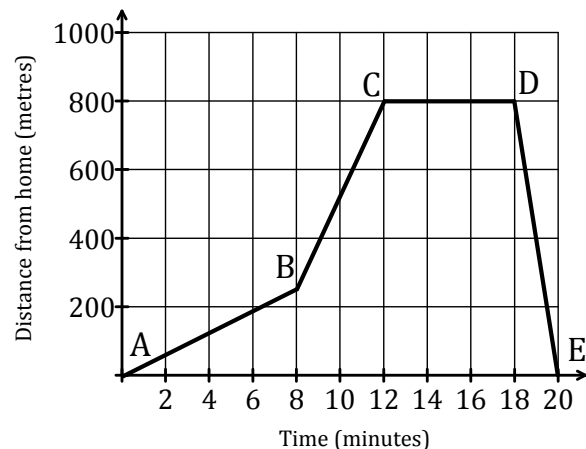
24. Simplify: $\dfrac{15x^3y^3-10x^2y^2+5xy^2}{5xy}$

(A) $3x^2y^2 - 2xy + 1$

(B) $15x^3y^3 - 10x^2y^2$

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

(D) $3x^2y^2 - 10x^2y^2 + 5xy^2$

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

Diagram 1   Diagram 2   Diagram 3   Diagram 4
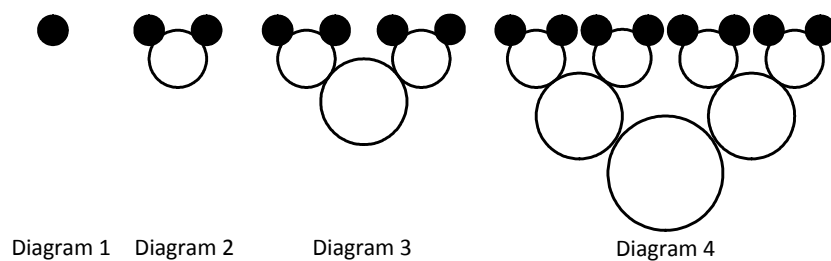
(A) 14

(B) 64

(C) 127

(D) 128

26. The table represents the height, in centimetres, 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) $h = 15t$

27. Which table represents a parabolic relation?

(A)

x	1	2	3	4	5	6
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

(B)

x	1	2	3	4	5	6
y	2	4	8	16	32	64

(C)

x	1	2	3	4	5	6
y	5	7	9	11	13	15

(D)

x	1	2	3	4	5	6
y	3	6	11	18	27	38

28. Which line is described by the equation $y = 3x - 2$?
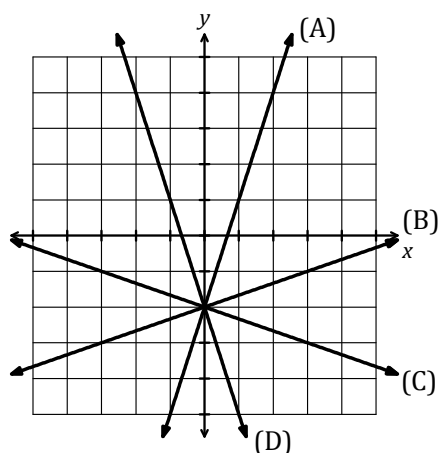
(A)   A

(B)   B

(C)   C

(D)   D

29. The volume of a rectangular pyramid is 120 cm³. What is the volume of a rectangular prism having the same base area and height, in cm³?

(A)   40

(B)   120

(C)   160

(D)   360

30. A water balloon of spherical shape has a diameter of 25 cm when filled. How much water can the balloon hold when filled completely, to the nearest cm³?

(A)   1963

(B)   7850

(C)   8177

(D)   65 417

31. Evaluate $2x^3 - xy$ for $x = -2, y = 3$.

(A) -22

(B) -10

(C) 10

(D) 22

32. Which triangle is unique?

(A)

(B)

(C)

(D)
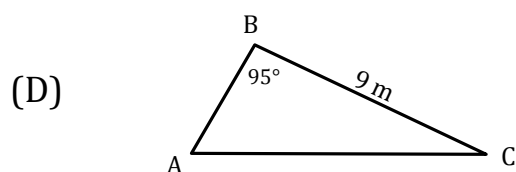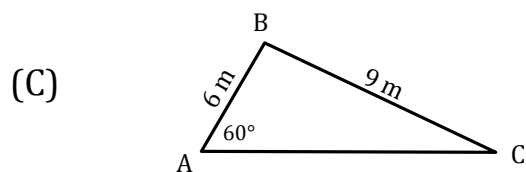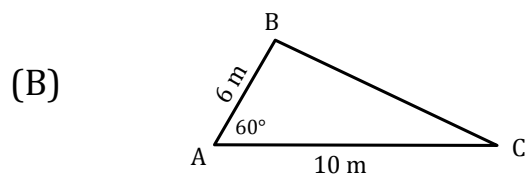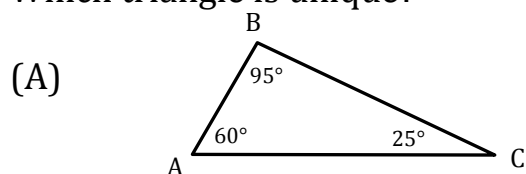
33. Given $\triangle XYZ \cong \triangle RNM$, which statement must be true?

(A) $\angle X = \angle N$

(B) $\angle Y = \angle N$

(C) $\overline{XY} = \overline{RM}$

(D) $\overline{YZ} = \overline{RN}$

34. A surveyor made the measurements as shown in the diagram below. How wide is the river ($\overline{AB}$), in metres?
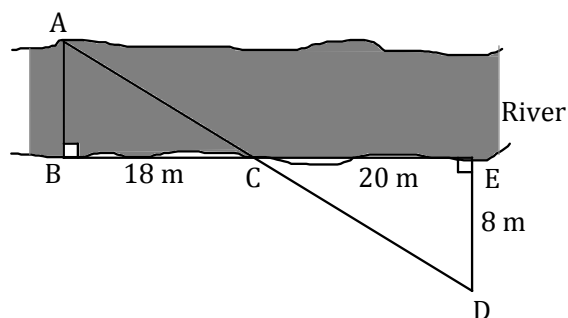
(A)   4.5

(B)   6.0

(C)   7.2

(D)   8.0

35. Given the diagram as shown, what is the length of $\overline{PQ}$, in centimetres?
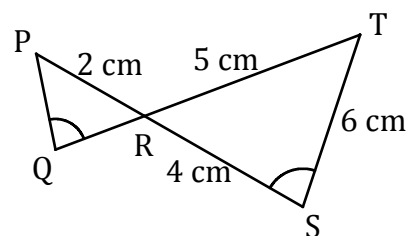
(A)   1.6

(B)   2

(C)   2.4

(D)   3

36. Which statement is true?

(A) If ΔABC ~ΔXYZ, then the two triangles are always congruent.

(B) If ΔABC ~ΔXYZ, then the two triangles are never congruent.

(C) If ΔABC ~ΔXYZ, then the two triangles are always similar.

(D) If ΔABC ~ΔXYZ, then the two triangles are never similar.

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

    (A)   (–3, 5)

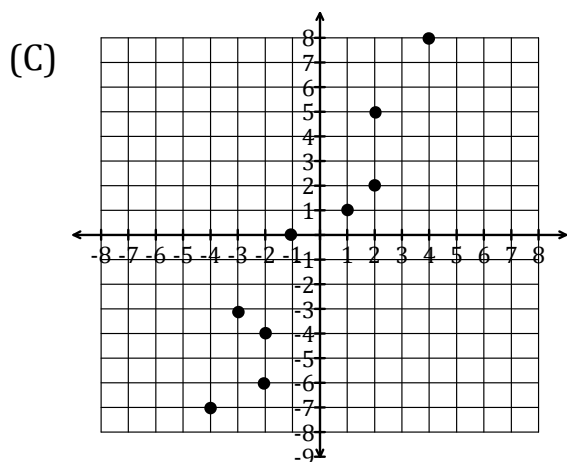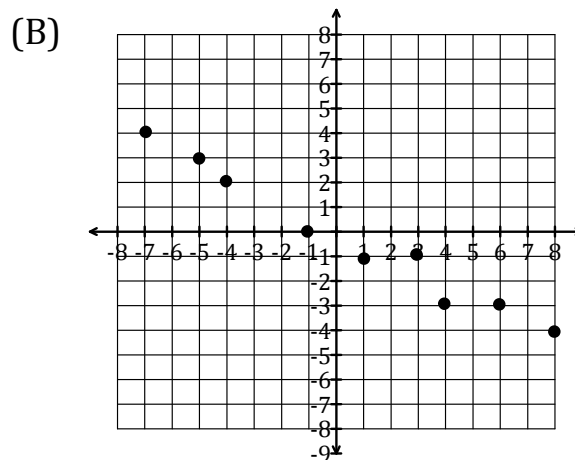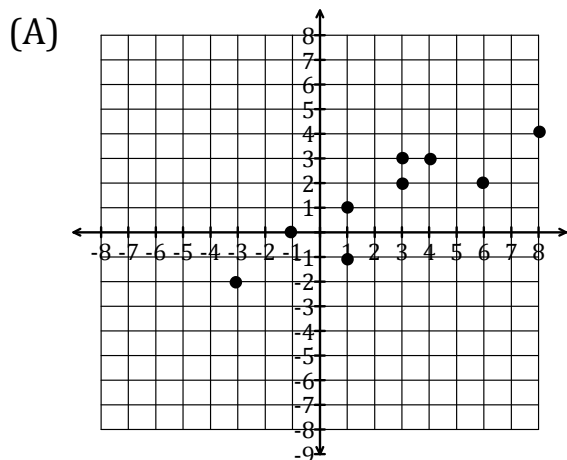   (B)   (–3, –5)

    (C)   (5, 3)

    (D)   (–5, –3)
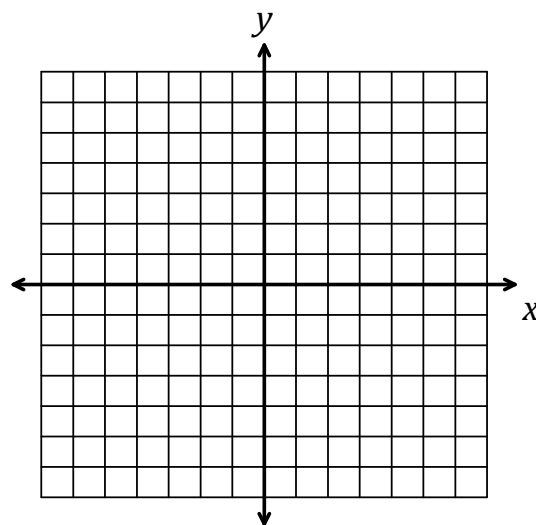
38. ΔABC has coordinates A(–5, 1), B(–1, 2), and C(–3, 2).
    ΔABC undergoes the translation $(x - 2, y + 3)$ followed by the
    translation $(x + 1, y + 2)$, to give the image ΔA"B"C".
    What single translation maps ΔABC onto ΔA"B"C"?
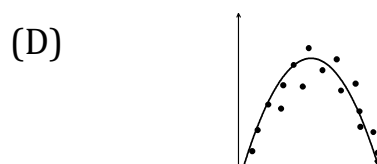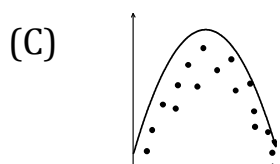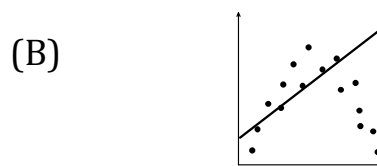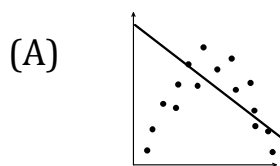
    (A) $(x, y) \rightarrow (x - 3, y - 1)$

    (B) $(x, y) \rightarrow (x - 3, y + 5)$

    (C) $(x, y) \rightarrow (x - 1, y - 1)$
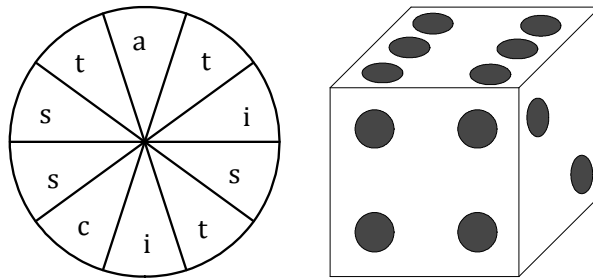
    (D) $(x, y) \rightarrow (x - 1, y + 5)$
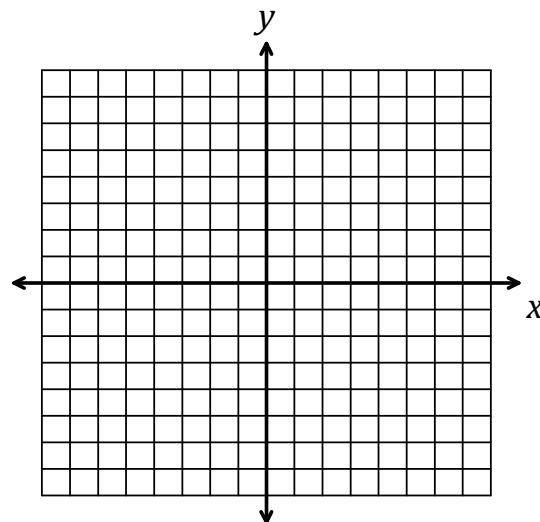
39.   Which scatter plot has an approximate line of best fit of $y = -2x$?

(A)

(B)

(C)

(D)
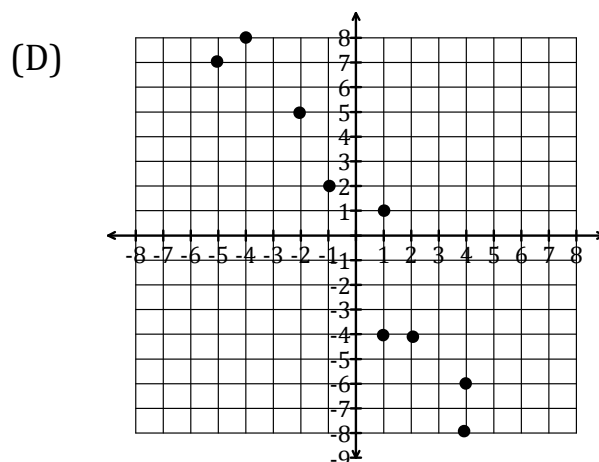
40.   Which line or curve drawn best fits the data in the scatter plot?

(A)

(B)

(C)

(D)

41. What is the probability of spinning a vowel on the spinner and rolling a number greater than 2 on a standard 6-sided die?

(A)   10%

(B)   13%

(C)   15%

(D)   20%

42. A bag contains 2 pink and 3 green marbles. What is the probability of picking two green marbles in a row if the first is not replaced before the second is picked?

(A) $\dfrac{3}{10}$

(B) $\dfrac{6}{25}$

(C) $\dfrac{9}{25}$

(D) $\dfrac{9}{20}$

End of the Assessment