

## **Intermediate Mathematics Provincial Assessment 2009**

This Student Work Booklet contains the remaining questions for the Intermediate Mathematics Provincial Assessment 2009.

You will need a pencil, paper, and a ruler for these questions.

You are also permitted the use of a calculator.

No question requires the use of a calculator.

You may use one if you choose. No graphing calculator is permitted.

### **Section 3: Calculators Permitted**

Section 3 contains 31 multiple choice questions (items 12–42) all having A, B, C, D choices. You are to shade the appropriate bubble (having the same number as the question) on the bubble sheet **using a pencil only**.

Do not shade more than one bubble or the question is scored as incorrect. Erase carefully with a good quality eraser if you need to change an answer.

Since the first question in this section is item 12, start with bubble 12. The last bubble you should shade in this assessment is 42 since the last multiple choice question you answer is item 42.

#### **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:  $SA = 4\pi r^2$

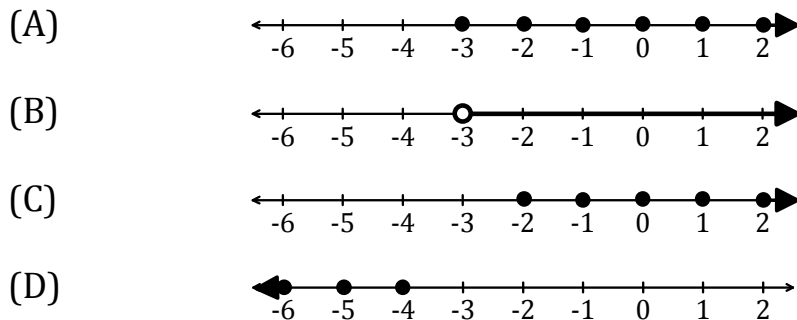
Surface Area of a Cone:  $SA = \pi r^2 + \pi r s$

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

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

**Please begin Section 3 now.**

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



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

15. A square has an area of  $200\text{cm}^2$ . 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			New Releases		
	Comedy	Horror		Comedy	Horror
Friday	125	75	Friday	300	200
Saturday	175	25	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.

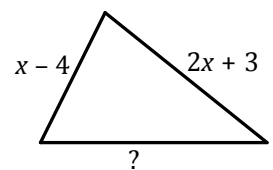
- (A)  $5^{10}$
- (B)  $5^{16}$
- (C)  $5^{17}$
- (D)  $5^{30}$

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

- (A)  $\frac{1}{a^{13}}$
- (B)  $\frac{1}{a^6}$
- (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)  $12x + 7$



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?

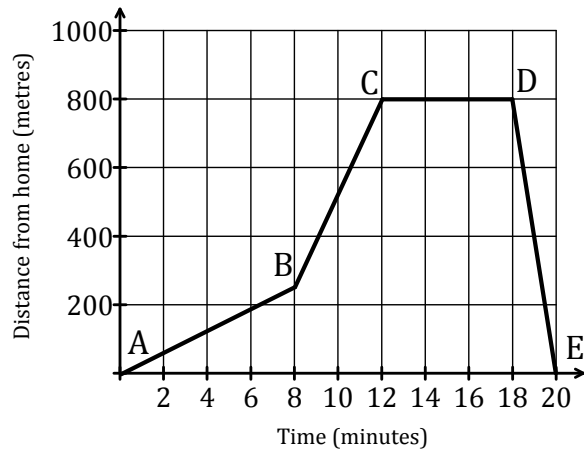
- (A)  $(x + 4)$  by  $(x - 6)$
- (B)  $(x - 4)$  by  $(x + 6)$
- (C)  $(x + 4)$  by  $(x + 6)$
- (D)  $(x - 4)$  by  $(x - 6)$

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?

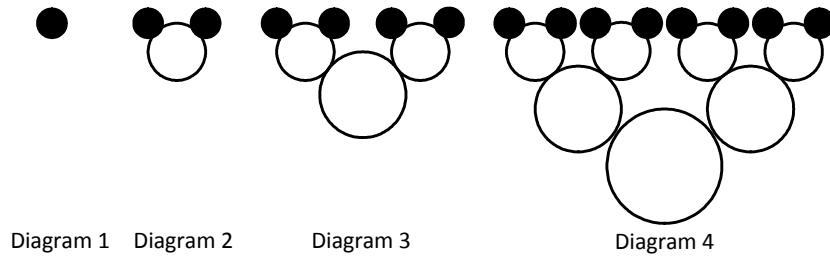
- (A) A to B
- (B) B to C
- (C) C to D
- (D) D to E



24. Simplify: 
$$\frac{15x^3y^3 - 10x^2y^2 + 5xy^2}{5xy}$$

- (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?



- (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

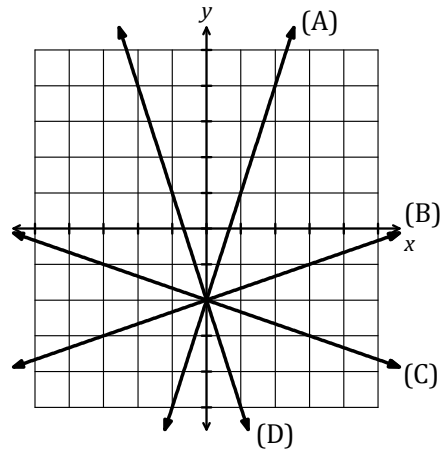
(C)

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  $y = 3x - 2$ ?

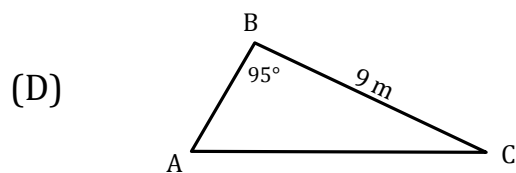
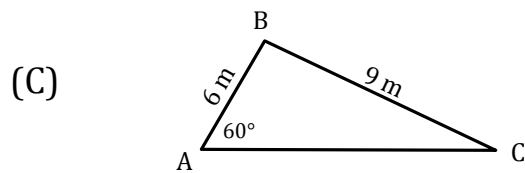
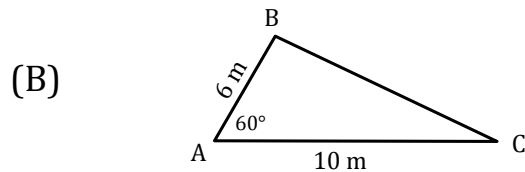
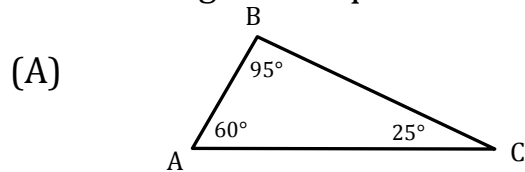


- (A) A
- (B) B
- (C) C
- (D) D
29. The volume of a rectangular pyramid is  $120 \text{ cm}^3$ . What is the volume of a rectangular prism having the same base area and height, in  $\text{cm}^3$ ?
- (A) 40
- (B) 120
- (C) 160
- (D) 360
30. A water balloon of spherical shape has a diameter of 25 cm when filled. How much water can the balloon hold when filled completely, to the nearest  $\text{cm}^3$ ?
- (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)  $22$

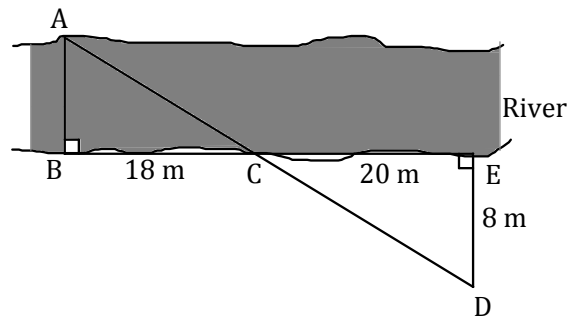
32. Which triangle is unique?



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

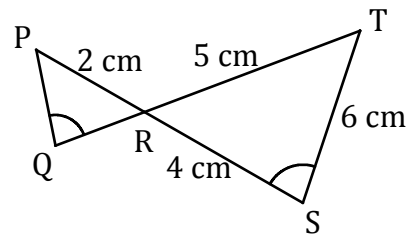
- (A)  $\angle X = \angle N$
- (B)  $\angle Y = \angle N$
- (C)  $\overline{XY} = \overline{RM}$
- (D)  $\overline{YZ} = \overline{RN}$

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?

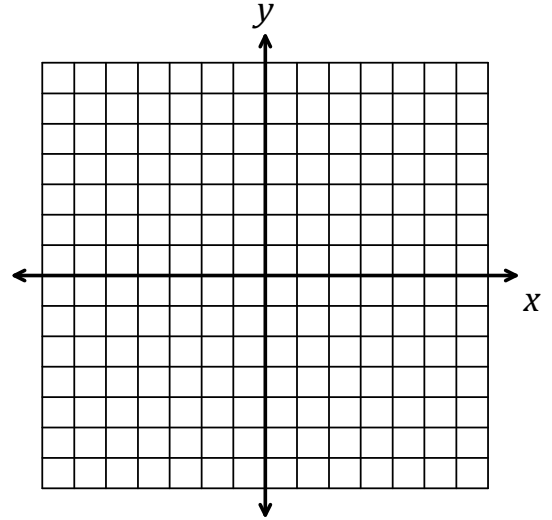
- (A) 1.6  
 (B) 2  
 (C) 2.4  
 (D) 3



36. Which statement is true?
- (A) If  $\triangle ABC \sim \triangle XYZ$ , then the two triangles are always congruent.  
 (B) If  $\triangle ABC \sim \triangle XYZ$ , then the two triangles are never congruent.  
 (C) If  $\triangle ABC \sim \triangle XYZ$ , then the two triangles are always similar.  
 (D) If  $\triangle ABC \sim \triangle XYZ$ , then the two triangles are never similar.

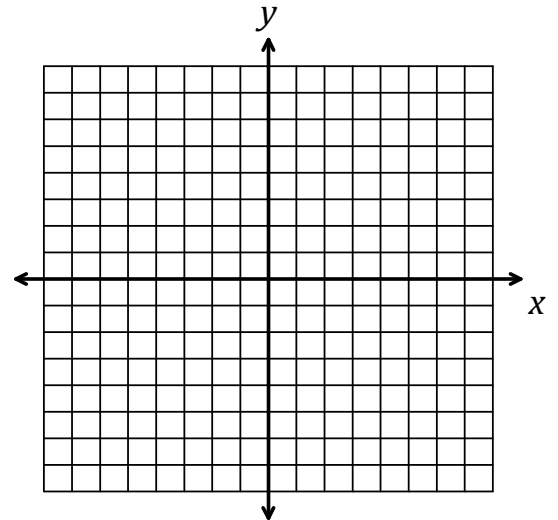
37. A point  $P(3, -5)$  is rotated  $90^\circ$  clockwise about the origin.  
What are the coordinates of the image point,  $P'$ ?

- (A)  $(-3, 5)$   
(B)  $(-3, -5)$   
(C)  $(5, 3)$   
(D)  $(-5, -3)$

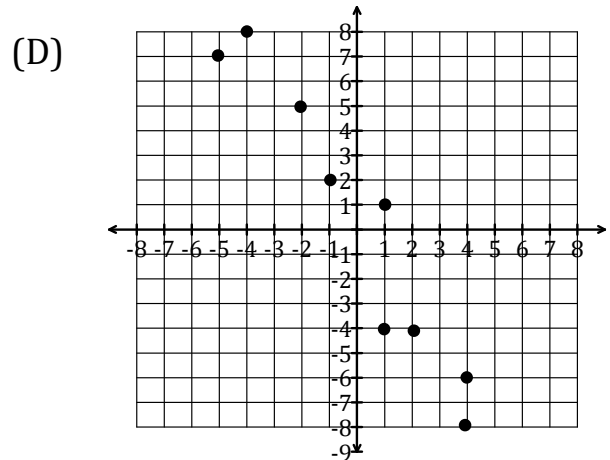
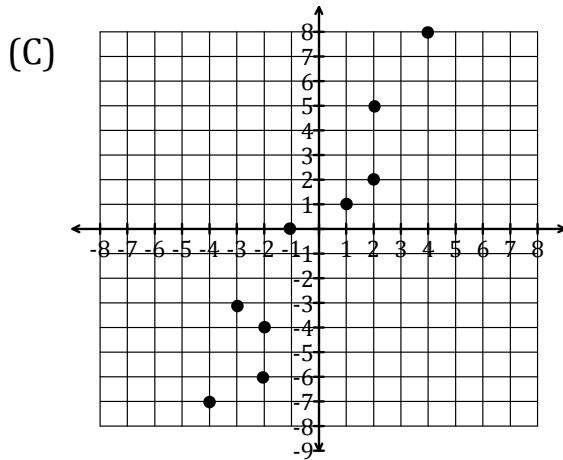
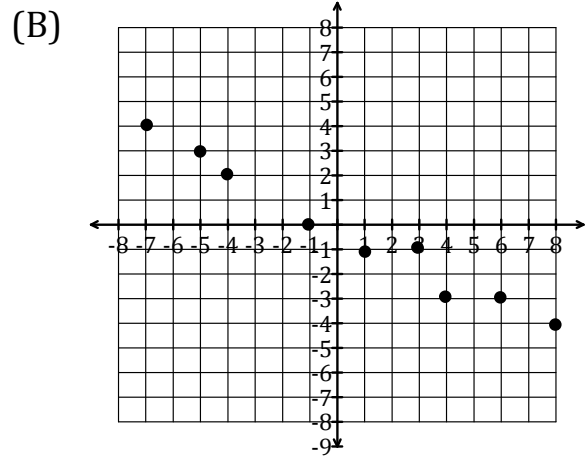
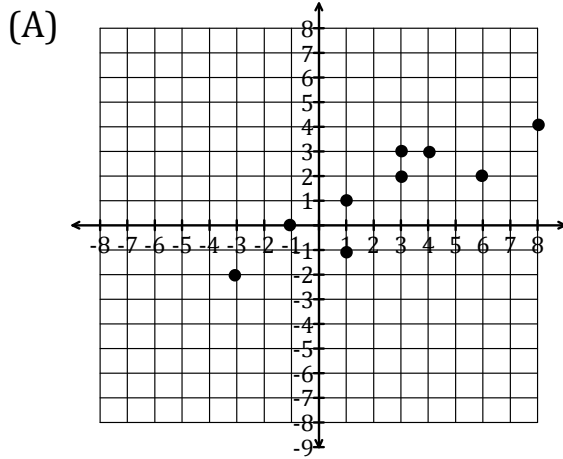


38.  $\triangle ABC$  has coordinates  $A(-5, 1)$ ,  $B(-1, 2)$ , and  $C(-3, 2)$ .  
 $\triangle ABC$  undergoes the translation  $(x - 2, y + 3)$  followed by the translation  $(x + 1, y + 2)$ , to give the image  $\triangle A''B''C''$ .  
What single translation maps  $\triangle ABC$  onto  $\triangle A''B''C''$ ?

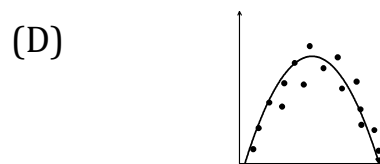
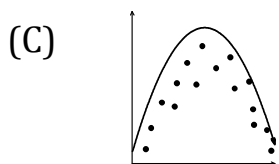
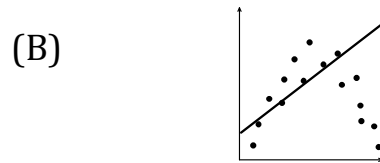
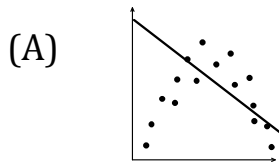
- (A)  $(x, y) \rightarrow (x - 3, y - 1)$   
(B)  $(x, y) \rightarrow (x - 3, y + 5)$   
(C)  $(x, y) \rightarrow (x - 1, y - 1)$   
(D)  $(x, y) \rightarrow (x - 1, y + 5)$



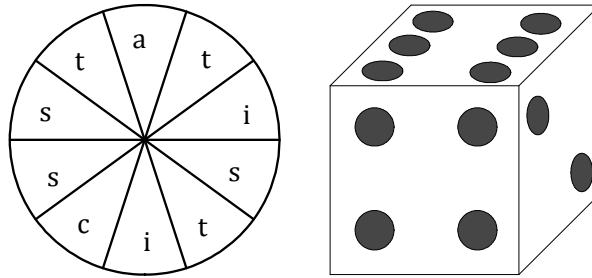
39. Which scatter plot has an approximate line of best fit of  $y = -2x$ ?



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



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)  $\frac{3}{10}$
- (B)  $\frac{6}{25}$
- (C)  $\frac{9}{25}$
- (D)  $\frac{9}{20}$

**End of the Assessment**