

PART A: MULTIPLE-CHOICE QUESTIONS
(calculator not permitted)

Value: 12 marks

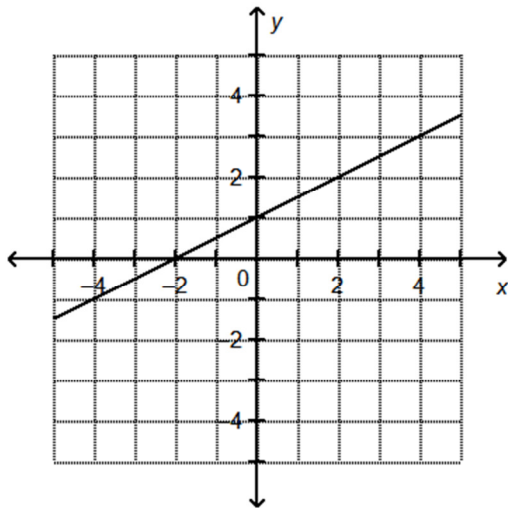
Suggested Time: 30 minutes
Allowable Time: 40 minutes

INSTRUCTIONS: No calculator may be used for this part of the examination. For each question, select the best answer and record your choice on the blue Answer Sheet provided. Using an HB pencil, completely fill in the bubble that has the letter corresponding to your answer. You have a maximum of 40 minutes to work on this section.

You have Examination Booklet Form A. In the box above #1 on your Answer Sheet, fill in the bubble as follows.

Exam Booklet Form/ Cahier d'examen	A	B	C	D	E	F	G	H
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1. Write an equation in slope-point for this line.



A. $y - 2 = \frac{1}{2}(x - 2)$

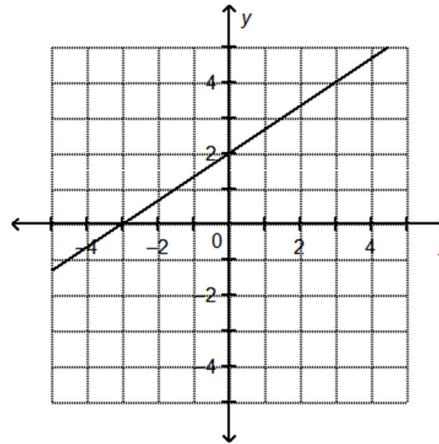
B. $y + 2 = -\frac{1}{2}(x + 2)$

C. $y - 2 = -\frac{1}{2}(x - 2)$

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

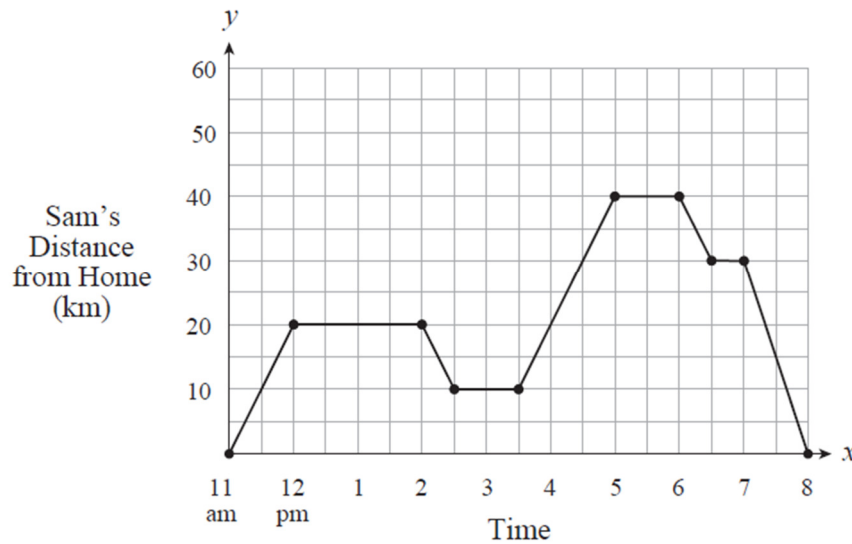
2. Which of the following equations describes the linear relation graphed below?

I	$y = \frac{2}{3}x + 2$
II	$y - 4 = \frac{2}{3}(x - 3)$
III	$3x - 2y + 2 = 0$



- A. I, II, and III
- B. I and II
- C. II and III
- D. I and III

3. The following graph represents Sam's trip.



When does Sam travel the fastest?

- A. 11:00 a.m. to 12:00 p.m.
- B. 2:00 p.m. to 2:30 p.m.
- C. 3:30 p.m. to 5:00 p.m.
- D. 7:00 p.m. to 8:00 p.m.

4. Solve for y in the following system of equations

$$\begin{aligned}2x + 3y &= 8 \\ x - 2y &= -3\end{aligned}$$

- A. 1
- B. 2
- C. 3
- D. 4

5. What is the least common multiple of 36 and 24?

- A. 2×3
- B. $2^2 \times 3$
- C. $2^3 \times 3^2$
- D. $2^5 \times 3^3$

6. Which of the following statements are true?

I	$\sqrt{9} = 3$ since $3 \times 3 = 9$
II	$\sqrt{12} = 6$ since $6 + 6 = 12$
III	$\sqrt[3]{49} = 7$ since $7 \times 7 = 49$
IV	$\sqrt[3]{64} = 4$ since $4 \times 4 \times 4 = 64$

- A. I, II, III, and IV
- B. I and II only
- C. I, III, and IV only
- D. I and IV only

7. Write $5\sqrt{2}$ as an entire radical.

- A. $\sqrt{10}$
- B. $\sqrt{20}$
- C. $\sqrt{50}$
- D. $\sqrt{100}$

8. Simplify $\sqrt{20}$

- A. $5\sqrt{10}$
- B. $2\sqrt{5}$
- C. $5\sqrt{2}$
- D. $25\sqrt{2}$

9. Simplify $(3x^4)^2(3x^2)$

- A. $27x^{10}$
- B. $9x^8$
- C. $9x^{10}$
- D. $3x^6$

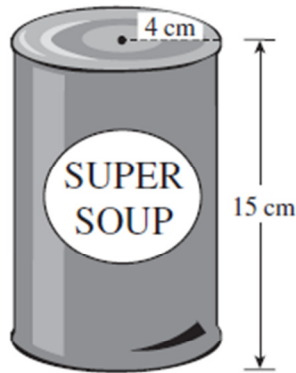
10. Evaluate $27^{\left(-\frac{2}{3}\right)}$

- A. -9
- B. $\frac{1}{9}$
- C. $\frac{1}{3}$
- D. 3

11. The distance from Bernadette's to Howard's house is 15 miles. Estimate this distance in kilometres.

- A. Almost 1 km
- B. 15 km
- C. 24 km
- D. 30 km

12. Soup is packaged in a container as shown below.



To determine the amount of soup in the container, which formula should be used?

- A. $V = \pi(4)^2(15)$
- B. $V = \frac{4}{3}\pi(4)^2$
- C. $SA = 2\pi(4)^2 + 2\pi(4)(15)$
- D. $SA = 4\pi(4)^2$

This is the end of Part A (calculator not permitted).

If there is some time left, you have two options:

- i) Make sure you have answered all the questions. You will not be able to go back to this section at the end of 40 minutes.
- ii) You may proceed to the rest of the examination without the use of a calculator; there are many questions that do not require a calculator. Make sure you flag any questions you skip to remember to go back to them later.

Do not access your calculator until directed by the supervisor. At the end of the 40 minutes, the supervisor will give you permission to access your calculator.

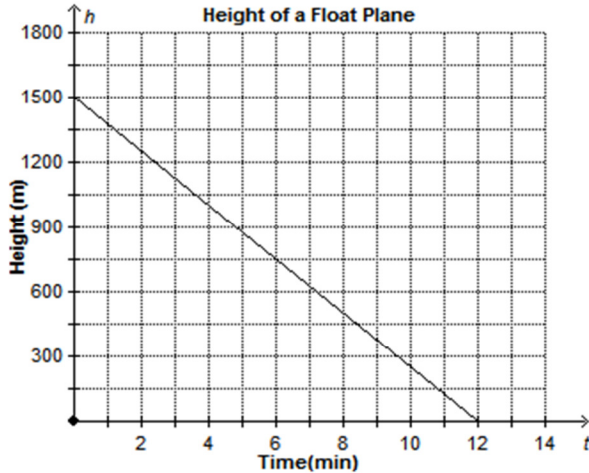
PART B: MULTIPLE-CHOICE QUESTIONS
(calculator permitted)

Value: 42 marks

Suggested Time: 75 minutes

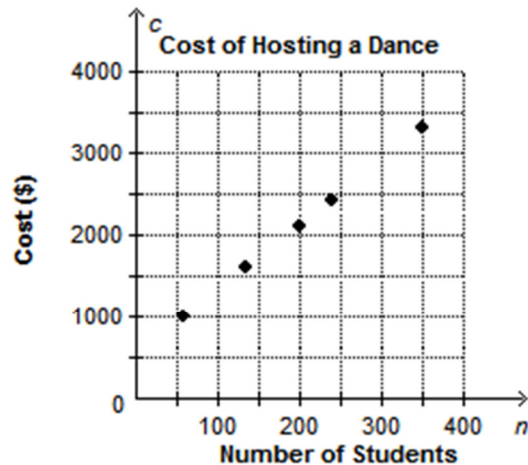
INSTRUCTIONS: For each question, select the best answer and record your choice on the white Answer Sheet provided. Using an HB pencil, completely fill in the bubble that has the letter corresponding to your answer.

13. The graph shows the height of a float plane as it descends to land. Determine the rate of change for this graph.



- A. -125 m/min
B. -0.008 m/min
C. 125 m/min
D. -1500 m/min

14. This graph shows the cost of hosting a dance, c , as a function of the number of students attending, n . What is a restriction on the domain?



- A. The domain can only contain positive numbers.
B. The domain can only contain whole numbers between 1000 and 3500.
C. The domain can only contain whole numbers.
D. The domain can only contain whole numbers that are multiples of 50.

15. Which set of ordered pairs does **not** represent a function?

- A. $\{(2, 5), (3, 8), (4, 11), (2, -1)\}$
- B. $\{(4, 6), (5, -7), (7, 9), (8, -10)\}$
- C. $\{(-3, -8), (-1, -6), (-2, 5), (0, 7)\}$
- D. $\{(7, 0), (4, -1), (-6, 5), (-8, 0)\}$

16. A line has x -intercept 2 and y -intercept 6. Determine the slope of the line.

- A. $\frac{1}{3}$
- B. 3
- C. -3
- D. $-\frac{1}{3}$

17. Points A(3, 8), B(-6, 3), and C (12, k) lie on the same line. What is the value of k ?

- A. 13
- B. 6
- C. -6
- D. -13

18. Joanne sells magazine subscriptions. The table below shows Joanne's pay for the number of subscriptions she sells. How much does Joanne earn for every magazine subscription she sells?

Number of Magazine Subscriptions Sold	Joanne's Pay (\$)
12	\$54.00
50	\$225.00
100	\$450.00

- A. \$54.00
- B. \$12.00
- C. \$5.00
- D. \$4.50

19. Which equation does not represent a linear relation?

- A. $y = x^2 - 10$
- B. $x = -5$
- C. $y = -6x + 10$
- D. $6x + 11y = 13$

20. Which of the following describe the same linear function?

I.															
II.	$x - 2y + 6 = 0$														
III.	<table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>1</td> <td>5</td> </tr> <tr> <td>2</td> <td>7</td> </tr> <tr> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> </tr> </tbody> </table>	x	y	0	3	1	5	2	7
x	y														
0	3														
1	5														
2	7														
.	.														
.	.														
.	.														
IV.	3 more than one half of a number.														

- A. I and III only
- B. I and IV only
- C. II and III only
- D. II and IV only

21. Determine the slope of the following relation: $3x - 2y + 4 = 0$

- A. $\frac{3}{2}$
- B. $-\frac{3}{2}$
- C. 2
- D. 3

22. Which of the following ordered pairs can be found on the graph of the line $4x + 3y = 36$?

I.	$(-9, 24)$
II.	$(-3, 8)$
III.	$(0, 12)$
IV.	$(12, 4)$

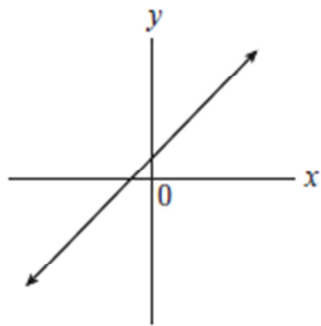
- A. I and III only
- B. II and III only
- C. II and IV only
- D. I, III and IV only

23. Which of the following is the equation of the horizontal line containing the point $(5, -4)$?

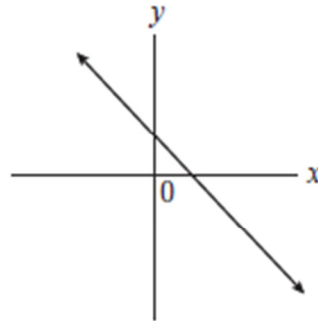
- A. $x = -4$
- B. $y = -4$
- C. $x = 5$
- D. $y = 5$

24. Which line has a positive slope and a negative x -intercept?

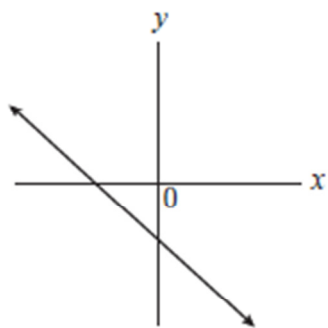
A.



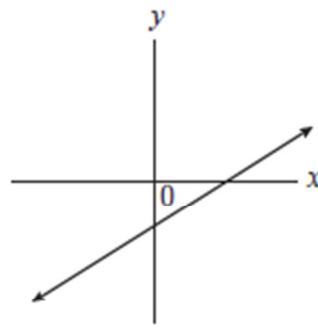
B.



C.



D.



25. Determine an equation of a line which has a slope of $\frac{1}{3}$ and passes through the point $(6, 0)$.

A. $x + 3y - 6 = 0$

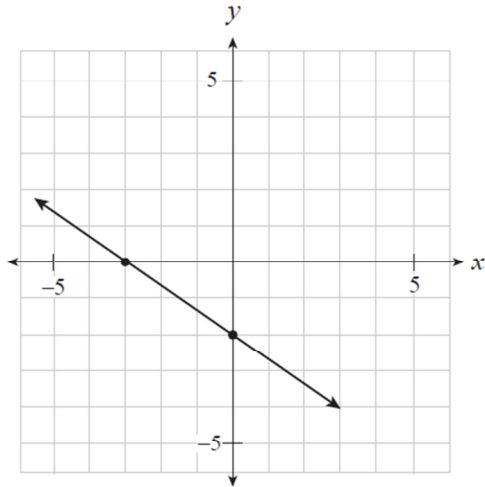
B. $x + 3y + 6 = 0$

C. $x - 3y - 6 = 0$

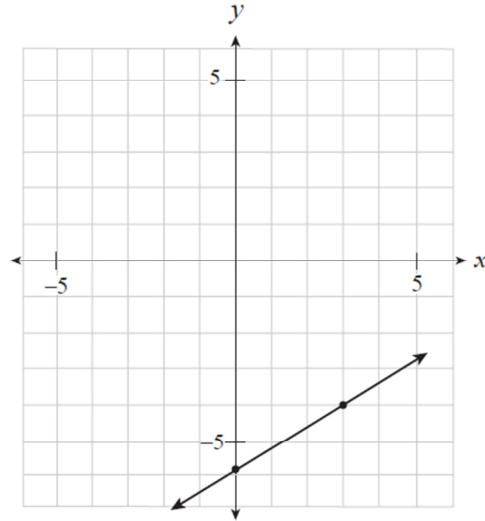
D. $x - 3y + 6 = 0$

26. Which of the following graphs represents the equation $2x - 3y - 6 = 0$?

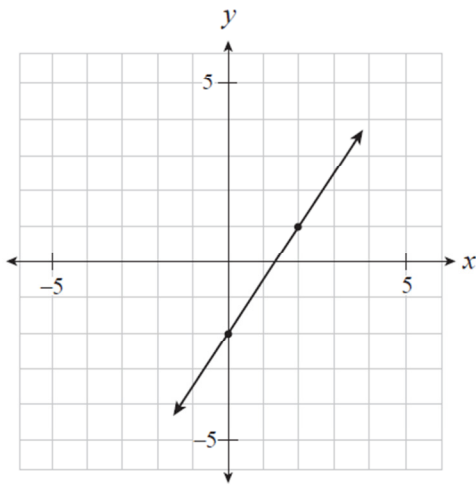
A.



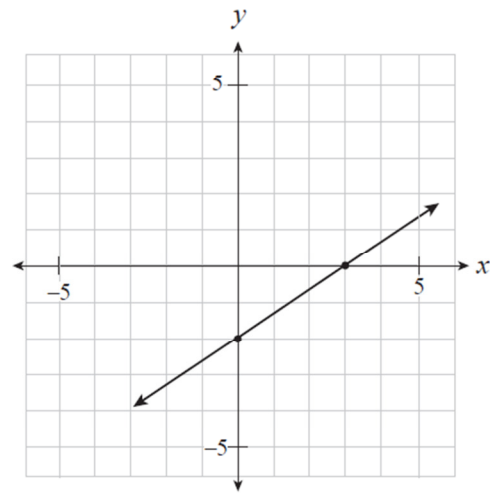
B.



C.



D.



27. The slope of a line segment joining $M(-8, 3)$ and $N(7, k)$ is $\frac{2}{5}$. Determine the value of k .

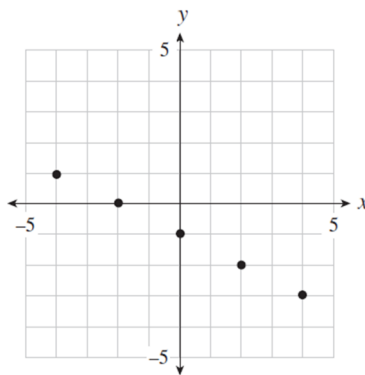
- A. $\frac{6}{5}$
- B. -9
- C. 9
- D. 13

28. For the grad banquet, there is a fixed cost of \$250 for the room rental plus a cost per person. If it costs \$3276 for 89 people, what is the cost for 110 people?

- A. \$4299
- B. \$4049
- C. \$3990
- D. \$3740

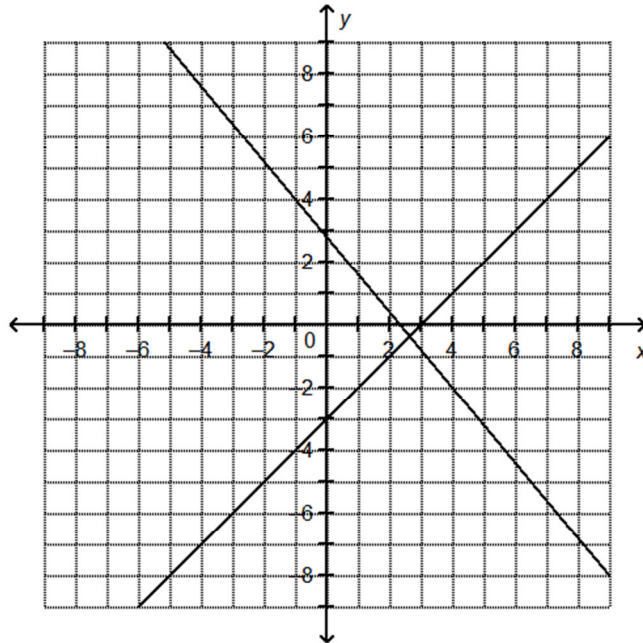
29. Determine the value of x if $f(x) = -2$.

- A. -2
- B. 0
- C. 2
- D. 4



30. Which linear system is represented by this graph?

- A. $x - y = 3$
 $6x + 5y = 14$
- B. $x + y = 5$
 $6x + 5y = 14$
- C. $x + y = 7$
 $7x + 5y = 14$
- D. $x + y = 9$
 $5x + 6y = 14$



31. The perimeter of a rectangular field is 276 m. The length is 18 m longer than the width. What are the dimensions of the field?

- A. 58 m by 80 m
- B. 68 m by 70 m
- C. 78 m by 60 m
- D. 48 m by 90 m

32. Sheldon borrowed \$10 000 for his university tuition. He borrowed part of the money at an annual interest rate of 2.4% and the rest of the money at an annual interest rate of 4.5%. His total annual interest payment is \$250.50. Determine the linear system that models this situation.

- A. $a + b = 10\,000$
 $0.024a + 0.045b = 250.50$
- B. $2a + 2b = 10\,000$
 $0.024a + 0.045b = 250.50$
- C. $0.024a + b = 10\,000$
 $a + 0.045b = 250.50$
- E. $a + b = 250.50$
 $0.024a + 0.045b = 10\,000$

33. Which of the following statements are true?

I.	A whole number is an integer.
II.	A rational number is a real number.
III.	A repeating decimal is an irrational number.
IV.	A rational number can be expressed as a fraction.

- A. I, II and III only
- B. I, II and IV only
- C. II, III and IV only
- D. I, II, III and IV

34. Write $\sqrt[4]{405}$ in simplest form.

A. $3\sqrt[4]{5}$

B. $81\sqrt[4]{5}$

C. $9\sqrt[4]{5}$

D. $5\sqrt[4]{3}$

35. Simplify $(27a^{12}b^9)^{\frac{2}{3}}$

A. $9a^8b^6$

B. $9a^{18}b^6$

C. $27a^8b^6$

D. $9a^8b^9$

36. Simplify : $\left(a^{\frac{1}{2}} \times a^{\frac{3}{2}}\right)^3$

A. $a^{\frac{9}{4}}$

B. a^5

C. a^6

D. a^8

37. Simplify : $(-48x^{-2}y^{-5}) \div (6x^3y^{-3})$

A. $-\frac{8}{x^5y^2}$

B. $-\frac{8}{xy^2}$

C. $-\frac{8}{xy^8}$

D. $-\frac{8x^5}{y^8}$

38. Simplify $(2m + 3n)^3$

A. $6m^3 + 9n^3$

B. $8m^3 + 27n^3$

C. $8m^3 + 24mn + 18mn^2 + 12m^2n + 36n^2 + 27n^3$

D. $8m^3 + 36m^2n + 54mn^2 + 27n^3$

39. Penny simplified the expression $(x + p)(x + q)$, where $p > 0$ and $q < 0$, to the form $x^2 + gx + k$.
What must be true about g and k ?

I	$g > 0$
II	$g < 0$
III	$k > 0$
IV	$k < 0$

A. I and IV only

B. II and IV only

C. II and III only

D. IV only

40. Determine a factor of $45a^2 - 125b^2$.

- A. $3a + 5b$
- B. $9a - 5b$
- C. $3a - 25b$
- D. $9a + 25b$

41. Determine a factor of $28x^2 + 5xy - 12y^2$

- A. $7x - 6y$
- B. $7x + 6y$
- C. $4x - 3y$
- D. $4x + 3y$

42. Completely factor $3x^2 + 66x - 144$

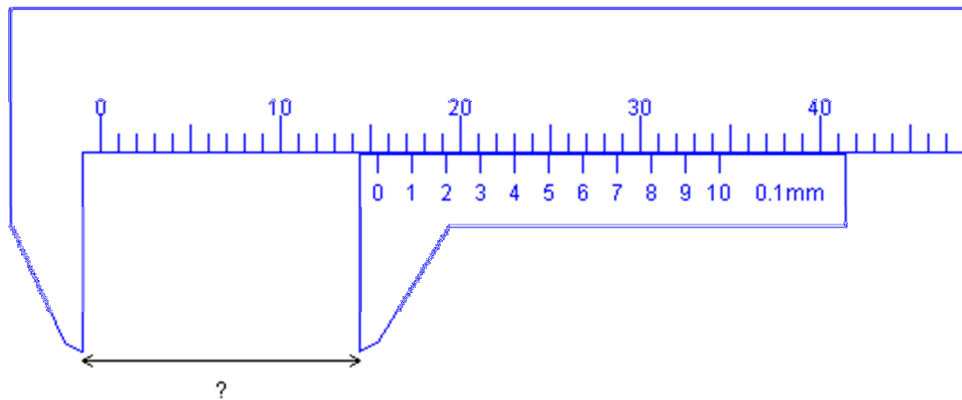
- A. $(x + 24)(x - 2)$
- B. $3(x + 24)(x - 2)$
- C. $(x + 24)(x - 6)$
- D. $3(x + 24)(x - 6)$

43. What value of k will make the following trinomial a perfect square?

$$x^2 + 8x + k$$

- A. 4
- B. 16
- C. 32
- D. 64

44. Determine the measure of the vernier caliper below.



- A. 9.4 mm
- B. 14.4 mm
- C. 15.04 mm
- D. 15.4 mm

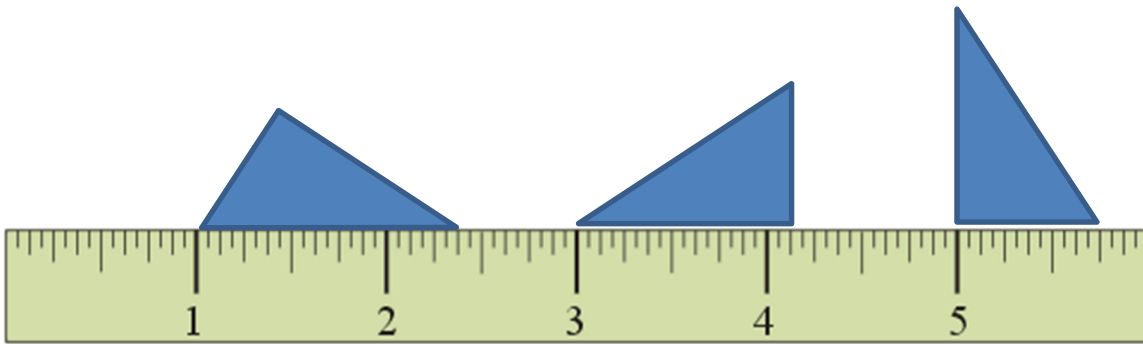
45. Which referent could you use for 1 mm?

- A. The width of the head of an ant
- B. The diameter of a beach ball
- C. The distance between British Columbia and Manitoba
- D. The length of a sheet of loose-leaf paper

46. Leonard knows he is 5 feet 6 inches tall. He applies for a new passport and needs to know his height in metric units. What is Leonard's height in centimetres?

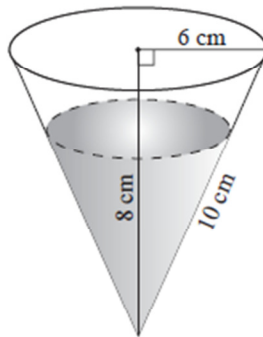
- A. 216.54 cm
- B. 170.69 cm
- C. 167.64 cm
- D. 152.40 cm

47. A triangle is rotated on a ruler below. Determine the perimeter of the triangle.



- A. $1\frac{3}{8}$ inches
- B. $3\frac{1}{4}$ inches
- C. $2\frac{5}{6}$ inches
- D. $3\frac{3}{8}$ inches

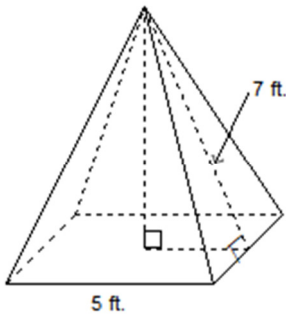
48. A paper cup at a water dispenser has a conical shape as shown in the diagram below.



The cup is full of water. If half of the water is poured out, what is the volume of water left in the cup?

- A. 151 cm^3
- B. 189 cm^3
- C. 302 cm^3
- D. 377 cm^3

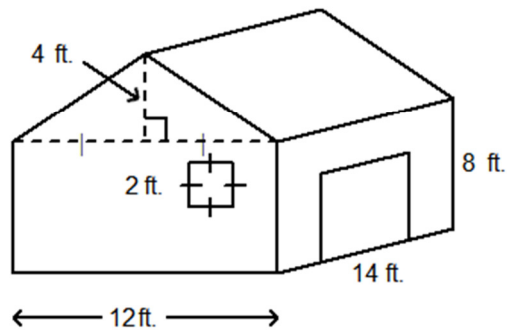
49. Calculate the volume of this right square pyramid to the nearest cubic foot.



- A. 58 cubic feet
- B. 54 cubic feet
- C. 41 cubic feet
- D. 18 cubic feet

50. A barn is a composite object formed by a right rectangular prism with a right triangular prism as its roof. The square window on the barn has side length 2 ft. A farmer wants to paint the entire surface of his barn, including the door, but not the window. Determine the surface area to be painted to the nearest square foot.

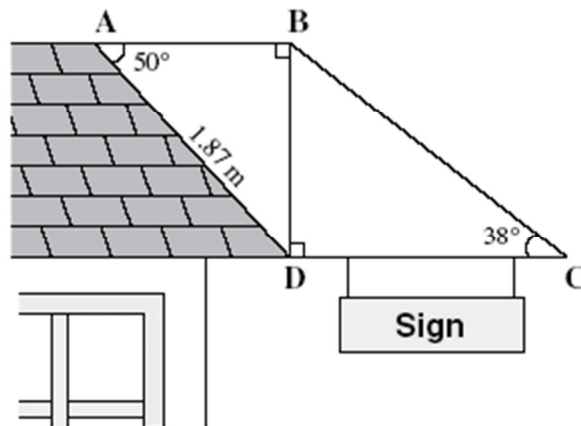
- A. 666 square feet
- B. 460 square feet
- C. 662 square feet
- D. 614 square feet



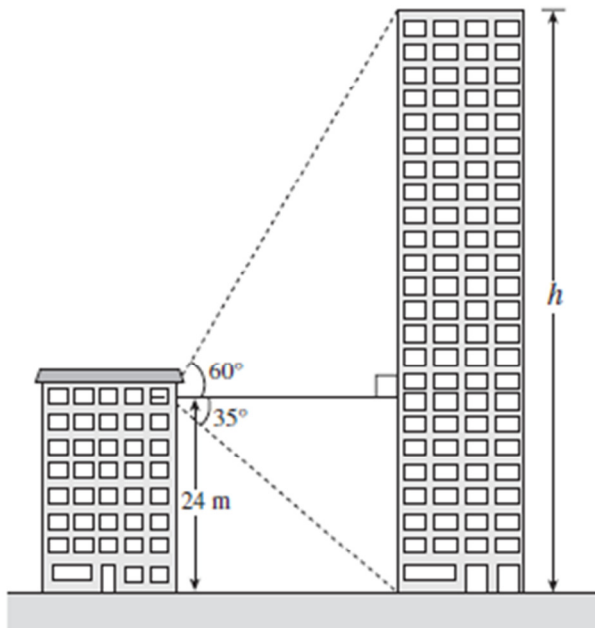
51. In order to hang a sign horizontally from the side of a roof, a special bracket must be created. The bracket is constructed of two right triangles $\triangle ABC$ and $\triangle BCD$ as shown.

If the side of the roof, AD , is 1.87 m long, what length, in metres, is the bracket piece DC ?

- A. 1.83 m
- B. 1.12 m
- C. 2.33 m
- D. 2.85 m



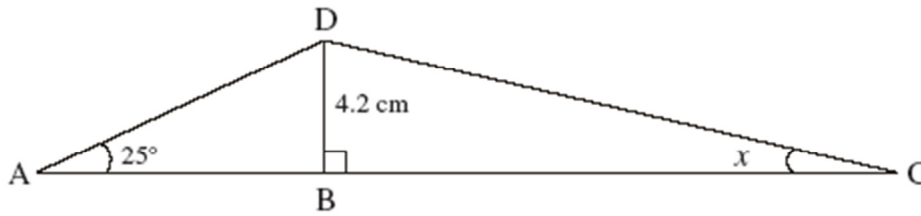
52. From an apartment window 24 m above the ground, the angle of depression to a nearby building is 35° and the angle of elevation is 60° as shown in the diagram below.



What is the height, h , of the nearby building?

- A. 46 m
- B. 53 m
- C. 83 m
- D. 94 m

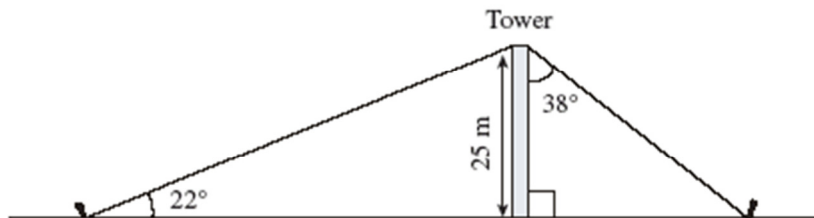
53. CB is twice the length of AB. The length of DB is 4.2 cm.



What is the measure of angle x ?

- A. 12.5°
- B. 13.1°
- C. 25.0°
- D. 47.0

54. Two guy wires support a tower of 25 m high.



What is the total length of the two guy wires?

- A. 31.73 m
- B. 66.74 m
- C. 98.46 m
- D. 107.34 m

PART C: NUMERICAL-RESPONSE QUESTIONS
(calculator permitted)

Value: 6 marks

Suggested Time: 15 minutes

INSTRUCTIONS: When answering numerical-response questions on your Answer Sheet:

- print digits as illustrated:

- shade the bubble with the negative symbol if the answer is negative; shade or leave blank the bubble with the positive symbol if the answer is positive.
- write your answer in the spaces provided using one digit per box, noting proper place value.
- leave unused boxes blank.
- For example, -70.2 will be written as:

$\begin{matrix} + & - \\ \circ & \bullet \end{matrix}$

- For example, 4 will be written as:

$\begin{matrix} + & - \\ \circ & \circ \end{matrix}$

or

$\begin{matrix} + & - \\ \bullet & \circ \end{matrix}$

- For example, $\frac{2}{3}$, answered to two decimal places, will be written as:

$\begin{matrix} + & - \\ \circ & \circ \end{matrix}$

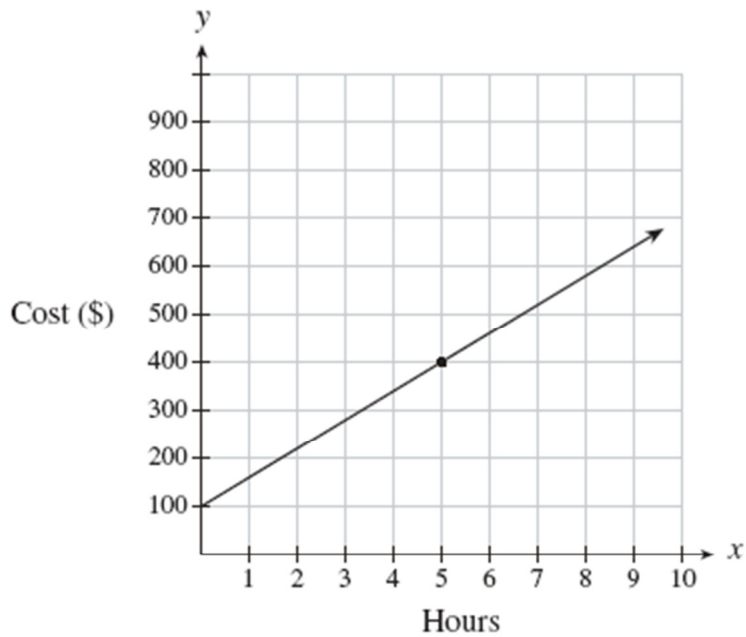
or

$\begin{matrix} + & - \\ \bullet & \circ \end{matrix}$

55. The equation of a line is $Ax + 4y + C = 0$. The slope is $-\frac{3}{2}$ and the y-intercept is 4.
What is the value of A?

Record your answer neatly on the Answer Sheet.

56. The following graph represents the cost of hiring a plumber to fix your leaky sink. What hourly rate does the plumber charge? Answer to the nearest dollar.



Record your answer neatly on the Answer Sheet.

57. A skateboard club holds a raffle. The profit, $P(n)$, is represented by the function $P(n) = 2n - 150$, where n is the number of tickets sold. How many tickets were sold if the profit is \$50.

Record your answer neatly on the Answer Sheet.

58. Determine the value of B if the product of $(2x + 1)(3x^2 + 4x - 3)$ is $Ax^3 + Bx^2 + Cx + D$.

Record your answer neatly on the Answer Sheet.

59. How many integer values are there for k for which $3x^2 + kx - 4$ is factorable?

Record your answer neatly on the Answer Sheet

60. A spherical balloon has a radius of 10 cm. If 10 000 cm^3 of additional air are pumped into the balloon, what is the new radius of the balloon? Answer to the nearest centimeter.

Record your answer neatly on the Answer Sheet.