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

Value: 12 marks

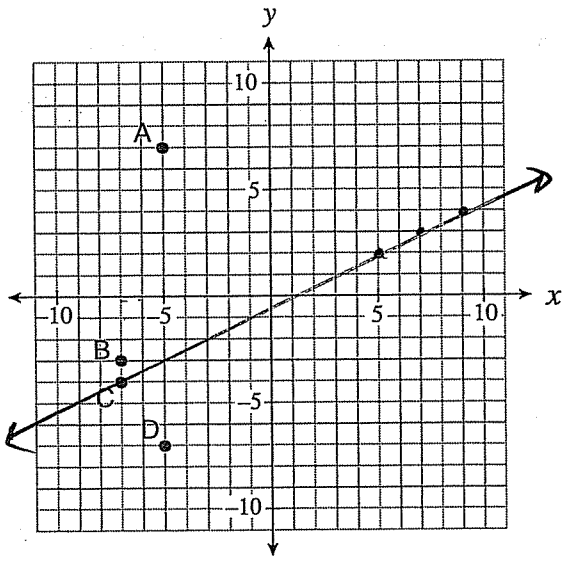
Suggested Time: 30 minutes
Allowable Time: 40 minutes

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 B**. 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
	○	●	○	○	○	○	○	○

Use the following graph to answer question 1.

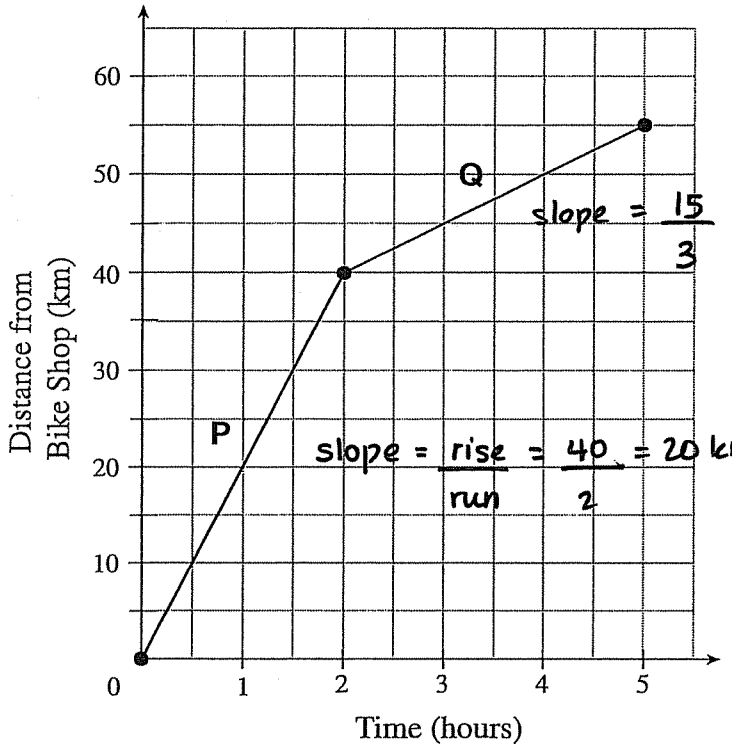


1. The line $y-2=\frac{1}{2}(x-5)$ passes through which point on the graph?

↖ passes through (5, 2)

A. A
B. B
C. C
D. D

2. The graph below models a bicycle's distance from a bike shop over time.



Calculate the change in the speed of the bike from segment P to segment Q.

A. decreased by 15 km/h
B. decreased by 5 km/h
C. increased by 15 km/h
D. increased by 11 km/h

20 − 15 = 5 km/hr

3. Solve the following system of equations:

$$4x+2y=8$$
$$-3x+y=-1$$

$y = 3x-1$ use substitution

A. (–3, 10)
B. (–1, 6)
C. (1, 2)
D. (3, 2)

$4x + 2(3x-1) = 8$

$4x + 6x - 2 = 8$

$+2 \quad +2$

$\frac{10x}{10} = \frac{10}{10}$

$x = 1$

4. How many solutions does this system of equations have?

$$y = 3x + 7$$
$$y = 3x - 4$$

same slope
diff. y-intercepts
∴ lines are parallel

(A) no solution
B. one solution
C. an infinite number of solutions
D. cannot be determined without solving

5. What is the least common multiple of 18 and 24?

A. 2×3
B. $2^2 \times 3^3$
(C) $2^3 \times 3^2$
D. $2^4 \times 3^3$

18 → $2 \cdot 3^2$ (2 · 9, 9 = 3 · 3)

24 → $2^3 \cdot 3$ (4 · 6, 4 = 2 · 2, 6 = 2 · 3)

6. What is the greatest common factor of 12, 24, 30, 72?

A. 360
B. 12
(C) 6
D. 2

12 : 2 · 2 · 3
24 : 2 · 2 · 2 · 3
30 : 2 · 3 · 10
72 : 2 · 2 · 2 · 3 · 3

$2 \cdot 3 = 6$

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

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

$2\sqrt{5} = \sqrt{2^2 \cdot 5} = \sqrt{4 \cdot 5} = \sqrt{20}$

8. Order the numbers from the smallest value to the largest value.

I.	$-3\sqrt{2}$
II.	$\sqrt{9}$
III.	$2\sqrt{3}$
IV.	$-2\sqrt{7}$

$= \sqrt{(-3)^2 \cdot 2} = \sqrt{18}$

$= \sqrt{2^2 \cdot 3} = \sqrt{12}$

$= \sqrt{(-2)^2 \cdot 7} = \sqrt{28}$

A. I, IV, II, III
B. I, IV, III, II
C. IV, I, II, III
D. IV, I, III, II

} wrong answers

II , III , I , IV

9. Simplify: $\left(2x^3\right)^3 \cdot 3x^4$

$(2x^3)^3 = 2^3 x^{3 \cdot 3} = 8x^9$

A. $24x^{36}$
B. $24x^{13}$
C. $18x^{36}$
D. $6x^{13}$

$(8x^9)(3x^4)$

$= 24x^{9+4}$

$= 24x^{13}$

10. A road sign says to turn right in 1000 feet. Approximately how far is this distance in kilometres?

A. 0.3 km
B. 0.6 km
C. 1 km
D. 1.5 km

11. Which of the following calculations converts 4 yards into centimetres?

A. $4 \text{ yd} \times \frac{2.54 \text{ cm}}{1 \text{ in}}$

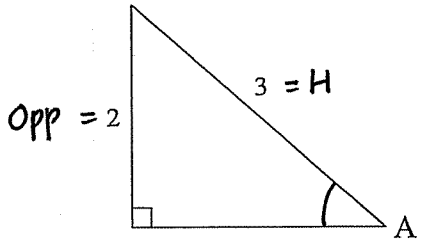
B. $4 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{2.54 \text{ cm}}{1 \text{ ft}}$

(C.) $4 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}}$

D. $4 \text{ yd} \times \frac{1 \text{ ft}}{3 \text{ yd}} \times \frac{1 \text{ in}}{12 \text{ ft}} \times \frac{1 \text{ cm}}{2.54 \text{ in}}$

12. Determine the ratio of $\cos A$.

$\cos A = \frac{\text{Adj.}}{\text{Hyp.}}$



Adj ↖ need to find this first

$2^2 + a^2 = 3^2$

$4 + a^2 = 9$

$-4 \quad -4$

$a^2 = 5$

$a = \sqrt{5}$

A. $\cos A = \frac{2}{3}$

(B.) $\cos A = \frac{\sqrt{5}}{3}$

C. $\cos A = \frac{\sqrt{13}}{3}$

D. $\cos A = \frac{3}{\sqrt{5}}$

$\cos A = \frac{\sqrt{5}}{3}$

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.

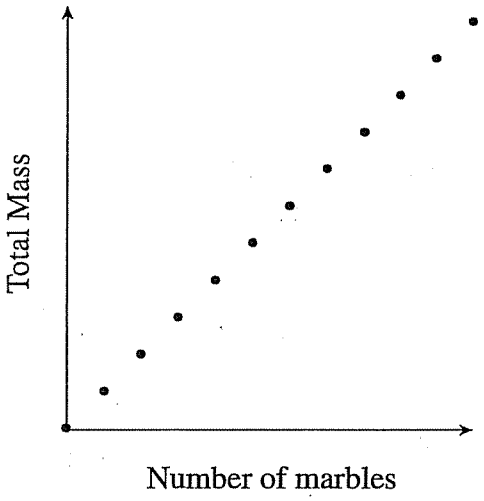
PART B: MULTIPLE-CHOICE QUESTIONS
(calculator permitted)

Value: 42 marks **Suggested Time: 75 minutes**

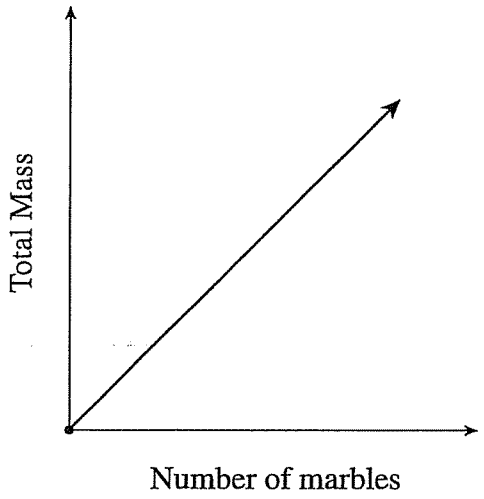
INSTRUCTIONS: For each question, select the **best** answer and record your choice on the **white Answer Sheet** provided. Using an HB pencil, completely fill in the bubble that has the letter corresponding to your answer.

13. Marbles are placed in a jar one at a time. Which graph below best represents the total mass of the jar and marbles as the marbles are added?

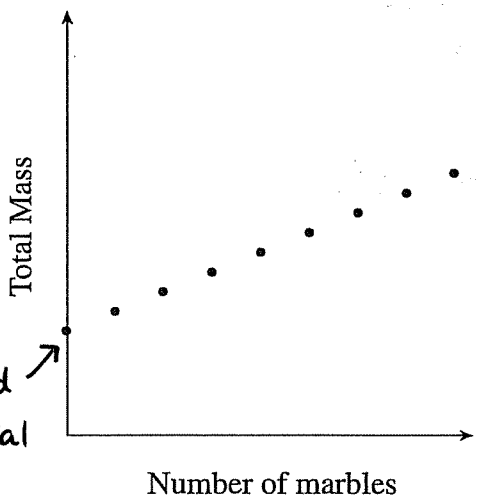
A.



B.

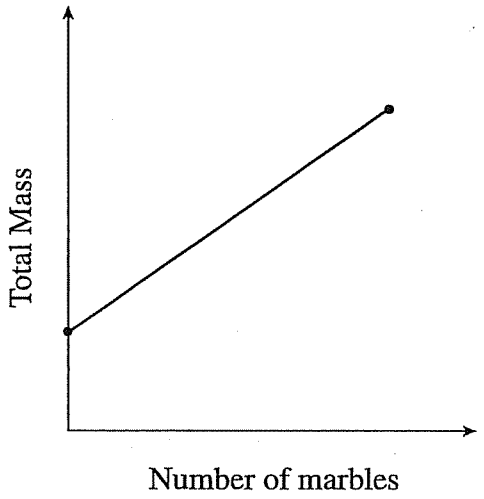


C.



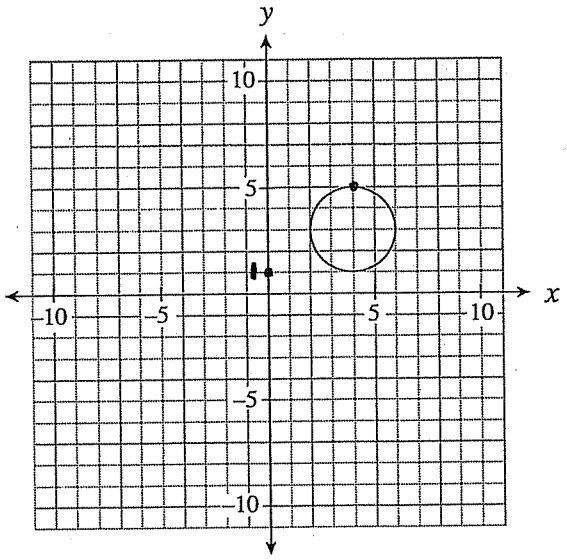
jar had an initial mass

D.



14. What is the range of the graph below?

y-values

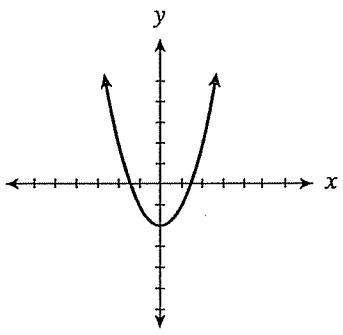


I.	All x values between 2 and 6 inclusive.
II.	$(2, 6)$
III.	$[1, 5]$ ✓
IV.	$1 \leq y \leq 5$ ✓

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

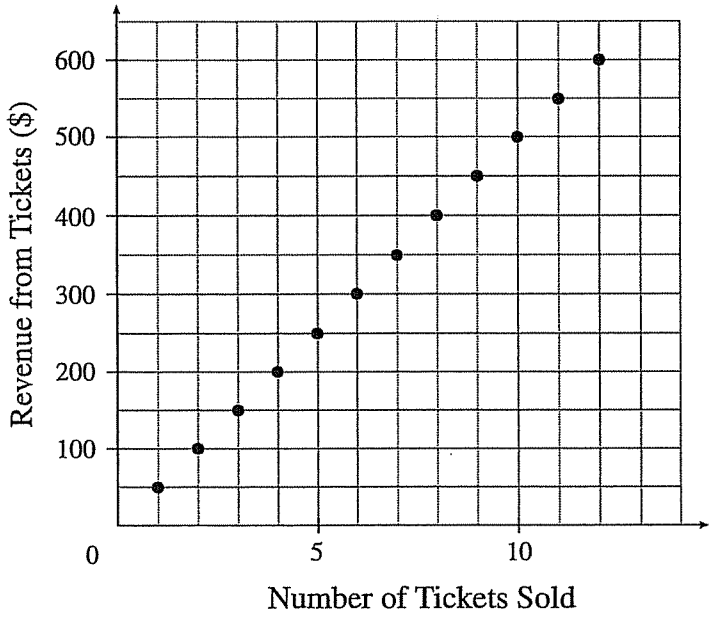
15. Which of the following relations are also functions?

same/repeated ∴ not a function

I.	$\{(0, 2), (1, 4), (3, 6), (4, 5), (4, 3), (7, -8)\}$
II.	$y = 2x + 5$ ✓
III.	The output is 6 more than half the input. ✓
IV.	 ✓

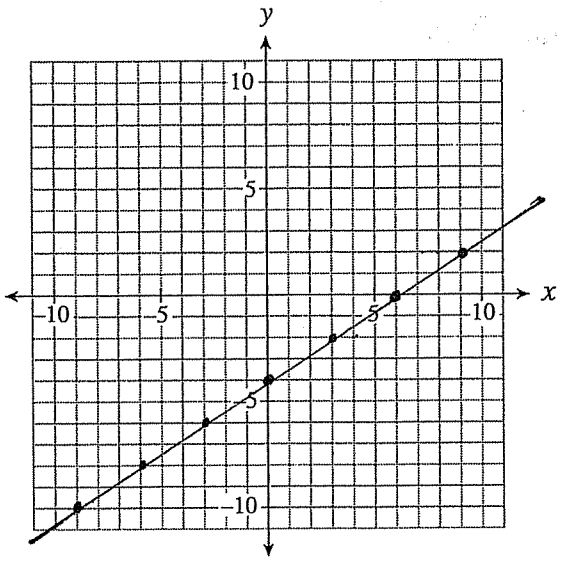
A. I only
B. I and IV only
C. II and III only
(D) II, III and IV only

16. What does the slope represent in the graph below?



(A) price per ticket
B. profit from tickets
C. revenue from tickets
D. number of tickets sold

The grid below may be used for rough work to answer question 17.



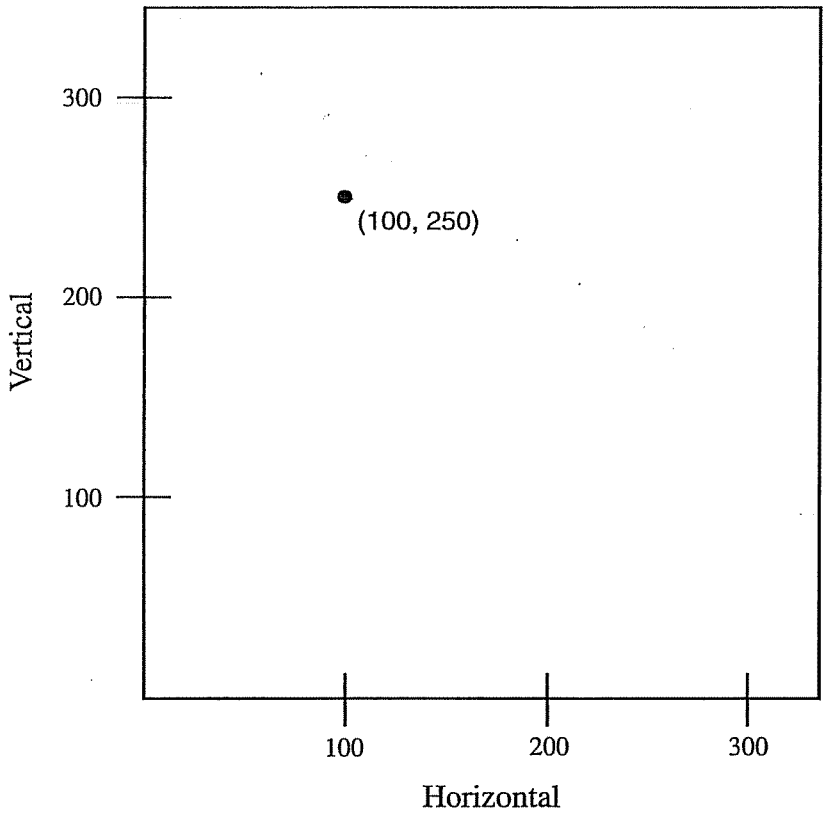
17. A line has a slope of $\frac{2}{3}$ and passes through the point $(6, 0)$. Which of the following points must also be on the line?

A. $(-3, -6)$
B. $(3, 8)$
C. $(4, -3)$
D. $(9, 3)$

18. A video game programmer needs to simulate a shot on a gaming screen. The shot needs to have a slope of $\frac{6}{5}$ to a target at $(100,\ 250)$. If the shooter has a horizontal position of 65, what would be the shooter's position on the screen?

↑x_1 ↑y_1 ↑x

Video Screen



A. (65, 78)
B. (65, 125)
C. (65, 208)
D. (65, 220.8)

$y - y_1 = m(x - x_1)$

$y - 250 = \frac{6}{5}(65 - 100)$

$y - 250 = \frac{6}{5}(-35)$

$y - 250 = -42$

$+250 \quad +250$

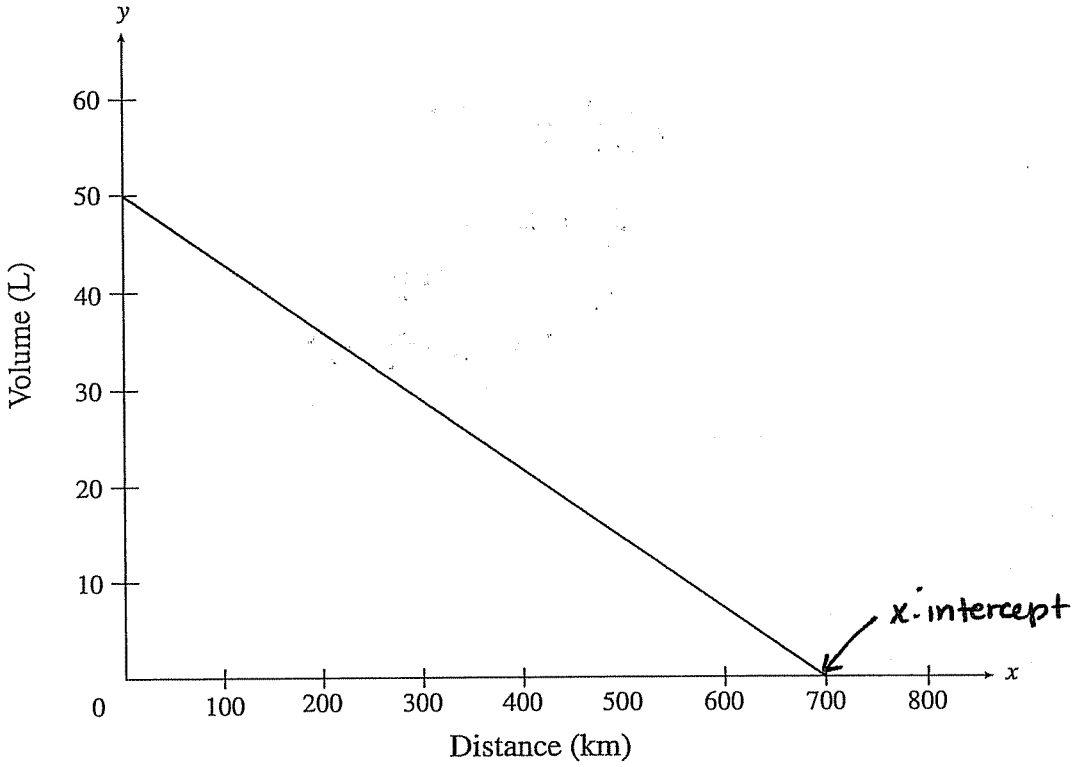
$y = 208$

19. Which of the following scenarios is **not** linear?

A. the height of a football thrown over time
B. the total weight of a jar of pennies as more pennies are added
C. the distance travelled by a car moving at a constant speed over time
D. the pay of a truck driver who earns $2500 a month, plus $0.50 for every kilometre he drives

Use the following graph to answer question 20.

Amount of Gasoline Remaining vs. Distance Driven



20. The graph above shows the relationship between the amount of gasoline remaining in a 50 L tank and the distance driven for a certain car.

What does the *x*-intercept represent in this situation?

A. fuel capacity of the gasoline tank
B. total distance travelled during a long trip
C. total distance driven until the car is out of gas
D. number of kilometres driven per litre of gasoline

---

21. Damien has a list of 37 potential customers for his house-painting business. In order to get a business grant, he must graph his income versus the number of customers. Determine the domain of the graph.

x-values

A. $\{0, 1, 2, 3, \ldots\}$
B. $\{0, 1, 2, 3, \ldots 37\}$
C. all real numbers
D. all real numbers between 0 and 37

22. Rewrite $y = \frac{x}{5} - 6$ in general form.

no fractions
x-term must be positive
all terms on same side

A. $\frac{x}{5} - y - 6 = 0$

B. $x + 5y - 6 = 0$

C. $x - 5y - 30 = 0$

D. $5x - 5y - 30 = 0$

$5(y) = \left(\frac{x}{5} - 6\right)5$

$5y = x - 30$

$-5y \qquad -5y$

$0 = x - 5y - 30$

23. Given the equation $Ax + By + C = 0$, which of the following conditions must be true for the graph of the line to have a positive slope and a positive y-intercept?

A. $A > 0,\ B > 0,\ C > 0$

B. $A > 0,\ B < 0,\ C > 0$

C. $A > 0,\ B > 0,\ C < 0$

D. $A > 0,\ B < 0,\ C < 0$

24. Which of the following lines have a negative slope?

I.	$y + 3 = 0$	no slope (horizontal line)
II.	$2x + y = 6$	$y = -2x + 6$
III.	$(y + 2) = -4(x - 5)$	

A. II only

B. III only

C. I and III only

D. II and III only

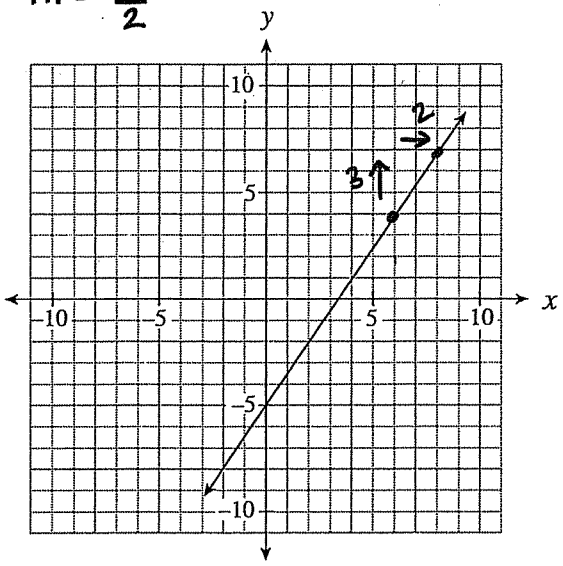
25. Which of the following statements are true for $2x + 3y = 6$?

✗	I.	The y-intercept is -2. $0 + 3y = 6$ $y = +2$.
✗	II.	The line is parallel to $y = 2x$. $\frac{3y}{3} = \frac{-2x}{3} + \frac{6}{3}$ $y = -\frac{2}{3}x + 2$
✗	III.	The slope-intercept form of the line is $y = \frac{2}{3}x + 2$.
✓	IV.	The range is all real numbers.

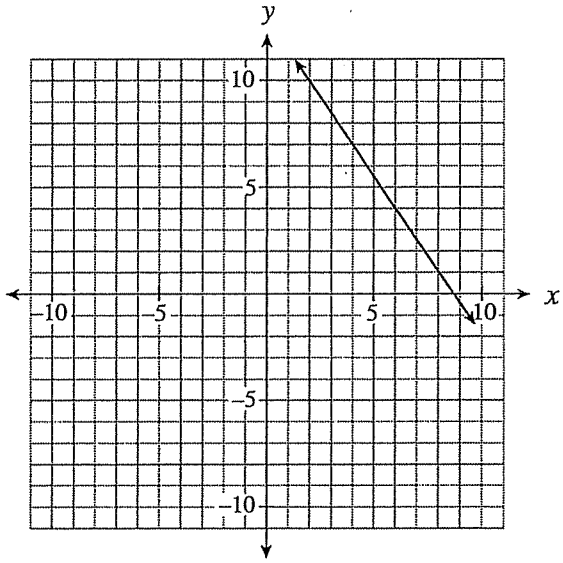
A. IV only
B. I and II only
C. I and IV only
D. III and IV only

26. Which of the following graphs represents a line that passes through $(6,\ 4)$ and is perpendicular to $y = -\frac{2}{3}x$?

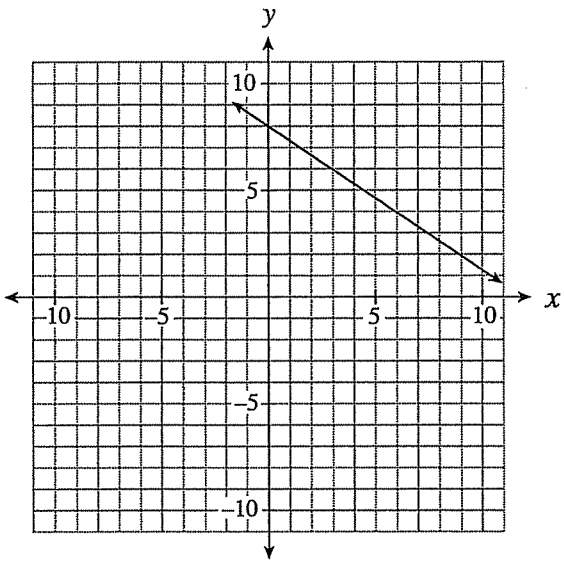
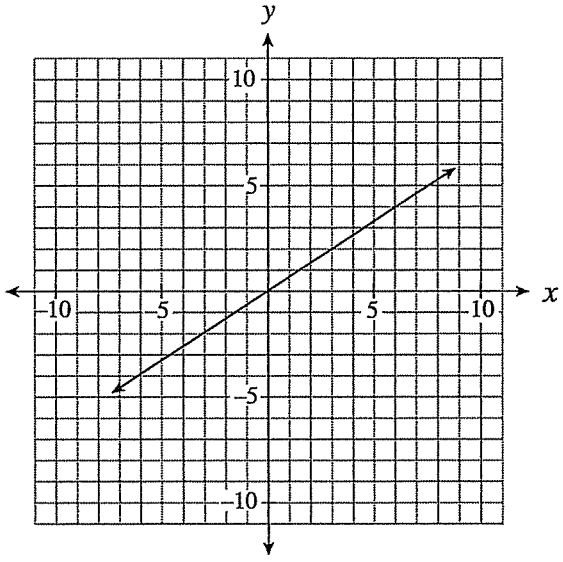
A. $m = \frac{3}{2}$



B.



C.



D.