

Academic

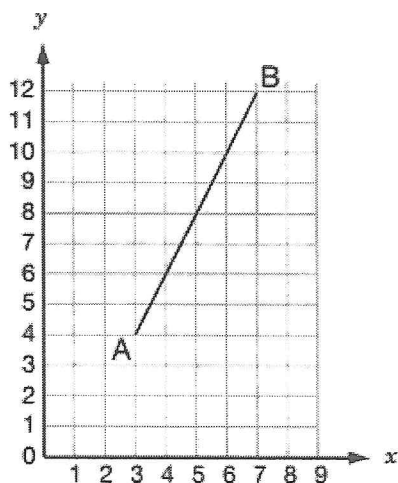
Grade 9 Assessment of Mathematics

Analyse Linear Relations Practice



Education
Quality and
Accountability
Office

- 1 If A is (3, 4) and B is (7, 12), which point is on the line segment AB?

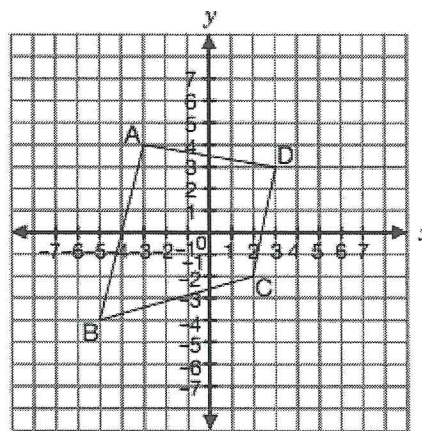


- A (3, 5)
- B (4, 8)
- C (5, 9)
- D (6, 10)

- 2 Rearrange $4y - x = 8$ so that it is in the form $y = mx + b$.

- a $y = x + 8$
- b $y = -x + 2$
- c $y = \frac{1}{4}x + 2$
- d $y = -\frac{1}{4}x + 2$

- 3 Four points, A, B, C and D, are marked on an xy -plane and joined by line segments as shown.



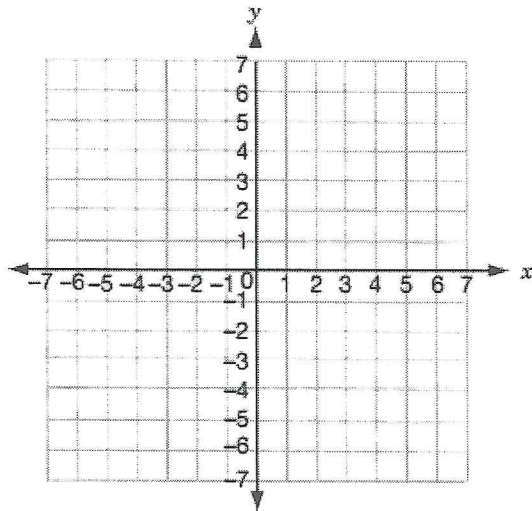
Which line segment has a **negative** slope?

- a BA
- b BC
- c CD
- d AD

- 4 Given A (2, 5) and B (-6, 5), which statement about the line segment AB is **true**?

- F The slope of AB is zero.
- G The slope of AB is positive.
- H The slope of AB is negative.
- J The slope of AB is undefined.

- 5 What are the coordinates of the point of intersection of the lines $y = -x + 1$ and $x = 3$?



- F $(3, -2)$
G $(3, 2)$
H $(2, 3)$
J $(-2, 3)$

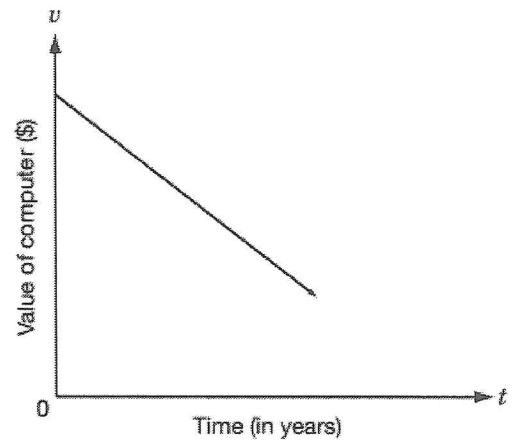
- 6 What is the equation of a line passing through the points $(2, 5)$ and $(4, 11)$?

- F $y = x - 3$
G $y = 2x - 1$
H $y = 3x - 1$
J $y = 4x - 3$

- 7 A computer is expected to decrease in value over time. The relationship between the value, v , of the computer in dollars after t years is written as the following equation:

$$v = -300t + 2100$$

A line representing the relationship is graphed.



What does the v -intercept of the line represent?

- F the decrease in value per year
G the initial value of the computer
H the number of years until the value is \$0
J the number of years the computer will work

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Soccer Shirts

Veza uses the equation $C = 43n + 50$ to model the cost of soccer shirts for the team, where

C represents the total cost in dollars,
and

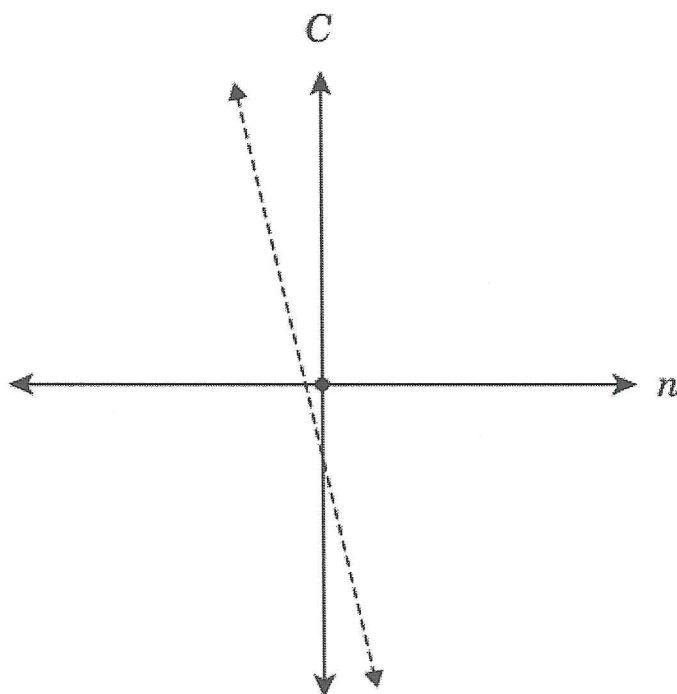
n represents the number of soccer shirts.



Veza sketches the graph of this relationship.

Explain why the graph shown **cannot** represent the total cost of soccer shirts.

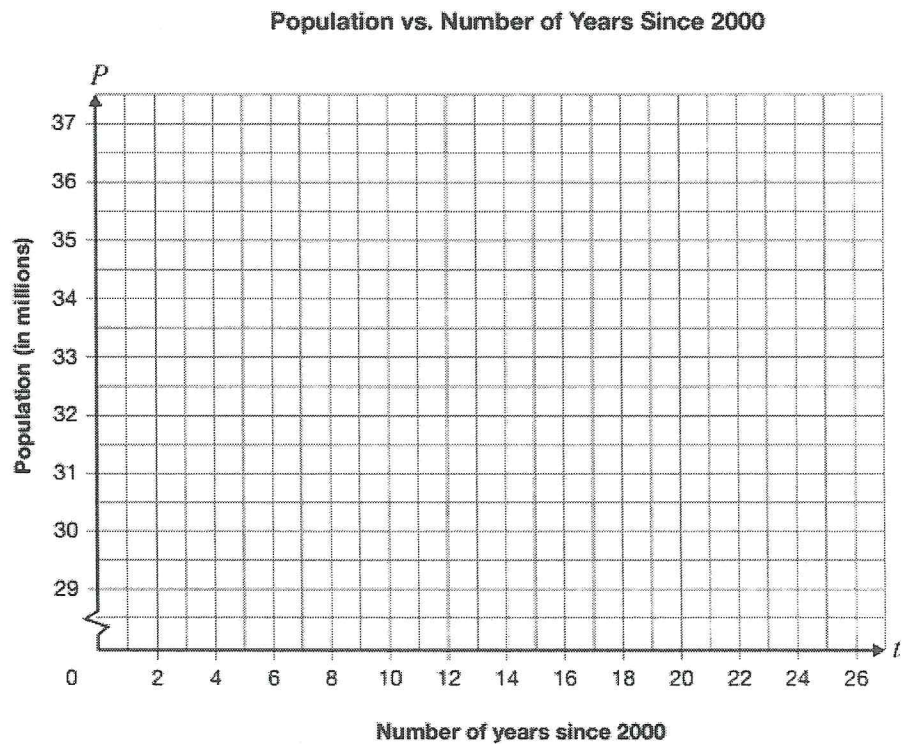
List at least two reasons.



Population Plans

Alvin is researching the population of Canada. He finds data for the year 2001 and predictions for every 5 years after that, as shown below.

Number of years since 2000, t	Population (in millions), P
1	31.1
6	32.2
11	33.4
16	34.4
21	35.4
26	36.2



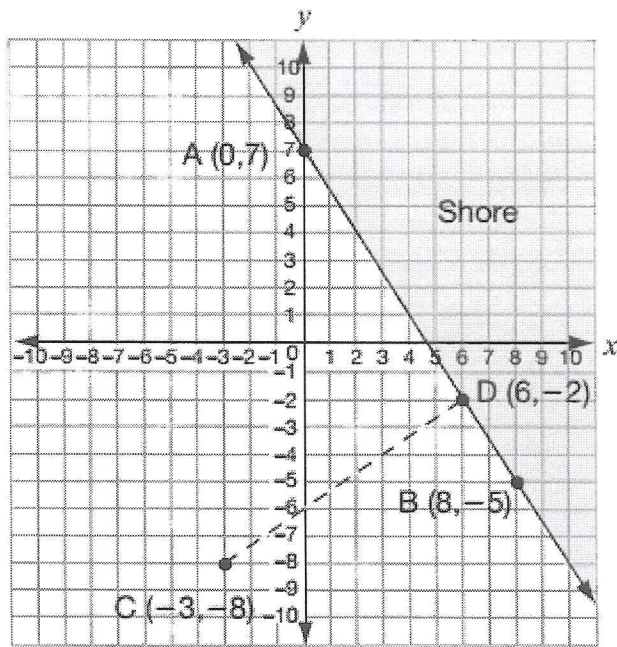
Determine an algebraic model for Alvin's data, and use it to make a reasonable prediction for the population of Canada in 2036.

Justify your answer.

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Washed Up on the Shore

A boat is travelling from Point C toward Point D, which is on the shoreline. The shoreline is represented by the line through points A and B.



Determine whether the path from C to D is perpendicular to the shoreline.

Justify your answer.

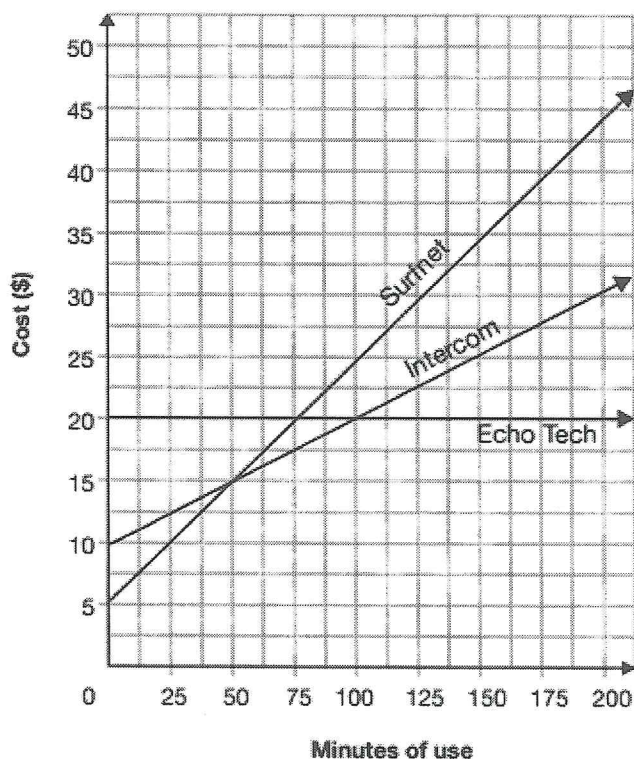
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Surfing the Net

The graph shows the relationship between total cost and minutes of use for three Internet companies.

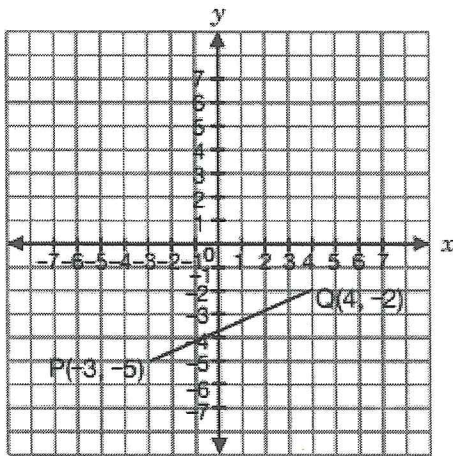
Tenisha wants to sign up with one of the companies and she wants to pay as little as possible. Her choice will depend on how many minutes of use she has.

Cost vs. Minutes of Use



Determine which company Tenisha should use. Include details about minutes of use in your explanation.

- 12 PQ is a line segment with slope $\frac{3}{7}$, as shown below.



The point R is plotted so that RQ is **perpendicular** to PQ.

Which of the following points could be point R?

- a (1, 5)
- b (2, 4)
- c (3, 2)
- d (4, 1)

- 13 How many of these equations represent straight lines?

$$y = x - 2$$

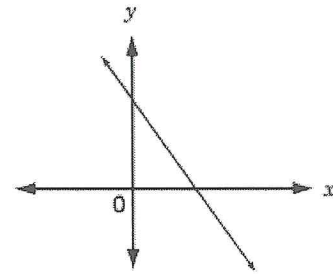
$$y = 2 - 4x$$

$$y = x^2 + 8$$

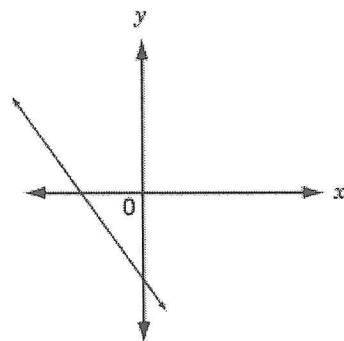
- a one
- b two
- c three
- d none

- 14 Which graph is the best match to a sketch of $y = -3x - 4$?

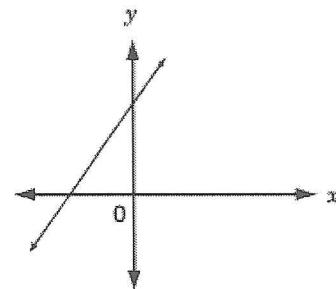
A



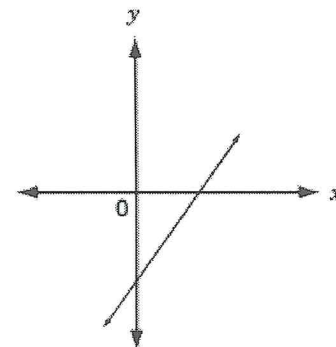
B



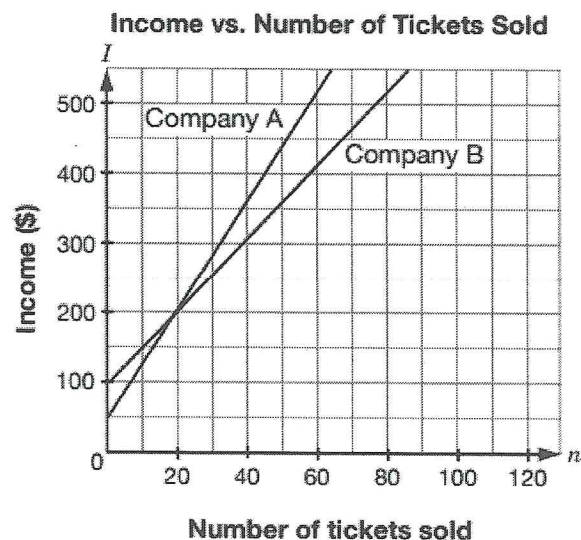
C



D



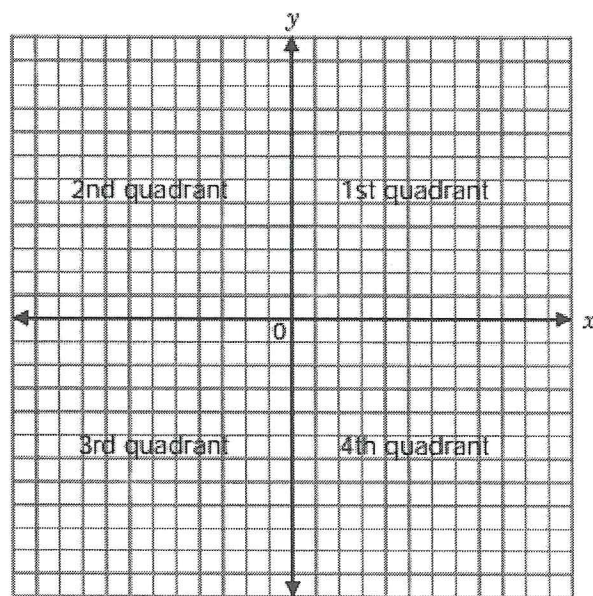
- 15 High school theatre companies earn their income through start-up grants and ticket sales. The graph shows the relationship between **income**, I , in dollars and **number of tickets sold**, n .



Which statement is true, given the information shown on the graph?

- A Company A always had more income than Company B.
- B The two companies had the same income when 40 tickets were sold.
- C Company A got a larger start-up grant than Company B.
- D Company A charged more per ticket than Company B.

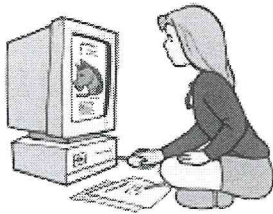
- 16 The equations $y = -x - 5$ and $y = 3$ represent straight lines that intersect.



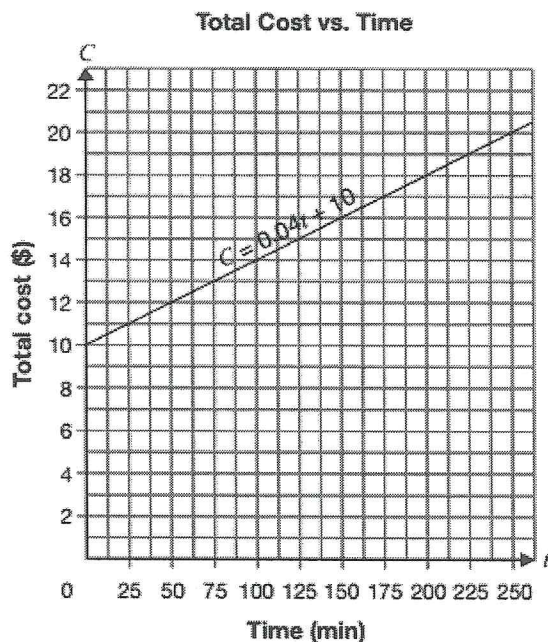
In which quadrant do they intersect?

- a 1st
- b 2nd
- c 3rd
- d 4th

- 17 Two Internet service providers are competing.



The equation $C = 0.04t + 10$ represents the relationship between the total cost, C , charged by Internet Connections and the time, t .

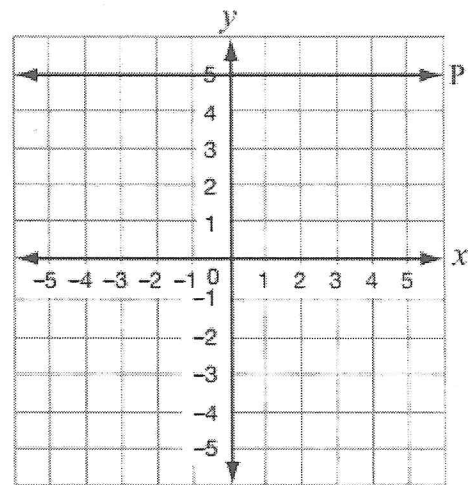


Surf Away wants **always** to be cheaper than Internet Connections.

Which of the following equations represents this situation?

- A $C = 15$
 B $C = 0.02t + 11$
 C $C = 0.03t + 9$
 D $C = 0.05t + 8$

- 18 Line P is shown below.



Which equation represents Line P?

- a $x = 5$
 b $y = 5$
 c $y = x + 5$
 d $x = y + 5$

ANSWERS

1. D
2. C
3. D
4. F
5. F
6. H
7. G
8. Initial value of number of shirts cannot be negative. Slope cannot be negative since it would mean cost is less for more shirts.
9. $P = 0.2t + 31$ approximate equation. 38.2million.
10. Yes, slopes are negative reciprocals.
11. Cost is less for Surfnet from 0 to 50 min, and Intercom for above 50min.
12. A
13. B
14. B
15. D
16. B
17. C
18. B