1. Karina has a job at a video store. The total she is paid each week is made up of an hourly rate plus \$14 for transportation.

One week, she works 20 hours and is paid \$215.

Which equation represents the relationship between Karina's total pay, P, in dollars, and the number of hours she works, n?

a $P = 10.75n + 14$

b $P = 14n + 10.75$

c $P = 10.05n + 14$

d $P = 14n + 10.05$

2. The table below represents a linear relation.

Time, t	Distance, D
0	5
1	15
2	25
3	35
4	45

Which equation represents this relation?

a $D = 5t$

b $D = 10t$

c $D = 10t + 5$

d $D = 5t + 10$

3. Which relation does **not** have an initial value of 50?

a $y = 50$

b $y = 50 + 8x$

c $y = 50x$

d $y = 50 - x$

4. Which of the following **cannot** be an equation of a line?

a $x = 2$

b $y = 7$

c $y = 2x^2 + 7$

d $2x + y + 7 = 0$

5. Which of the following is the equation of the line $6x - 2y - 12 = 0$ in the form $y = mx + b$?

a $y = -3x + 6$

b $y = 3x - 6$

c $y = -\frac{1}{3}x + 12$

d $y = \frac{1}{3}x - 12$

6. Alex has \$150. She spends the same amount each week. After 6 weeks, she has \$30 remaining.

The relationship between the amount of money Alex has and the number of weeks is represented by a line. What is the slope of this line?

a -25

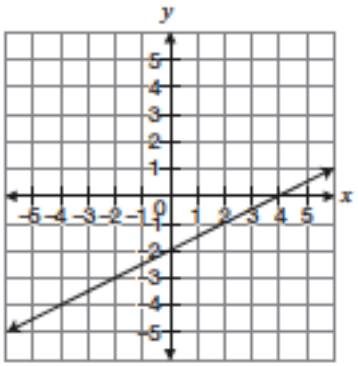
b -20

c 20

d 25

7. Which of the following represents the graph of the equation $2x - 4y = 8$?

a



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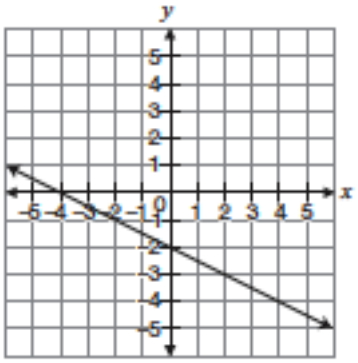

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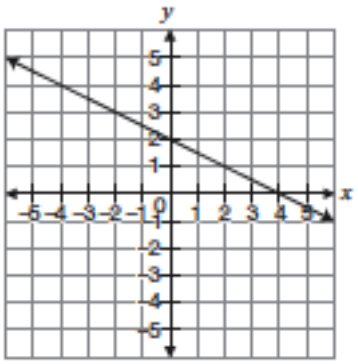

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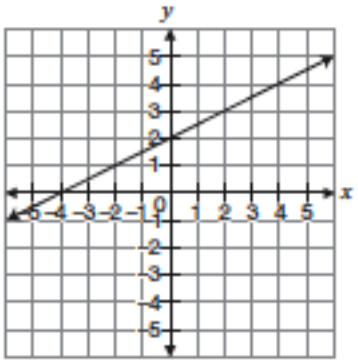
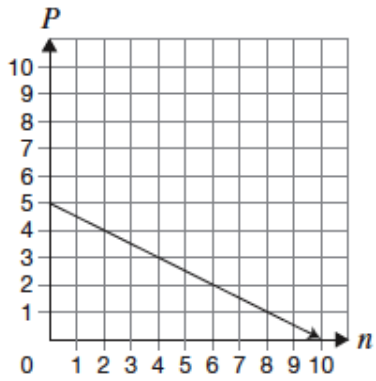


8. Which graph represents the equation $P = -\frac{1}{2}n + 5$?

a



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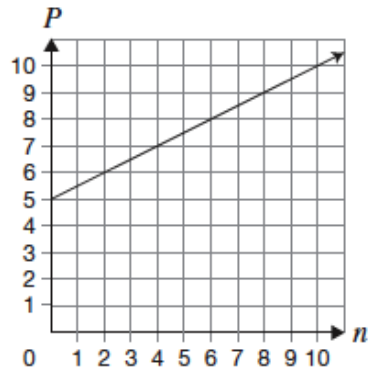
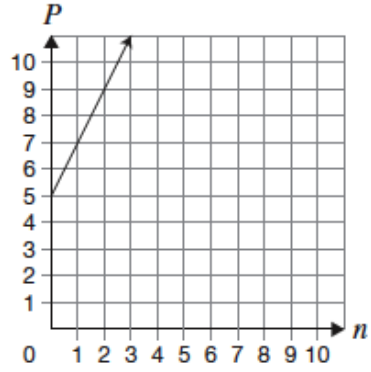
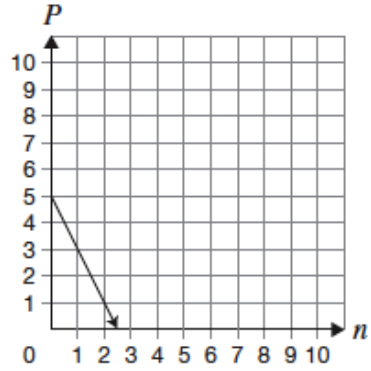


c



d



9. A sports company uses the equation $C = 8t + 5$ to represent the relationship between the total amount charged to rent a canoe, C, in dollars and the rental time, t, in hours.

What is the initial charge to rent a canoe?

a $0

b $5

c $8

d $13

10. Which equation represents a line that has the same y-intercept as $2x + 3y - 6 = 0$?

a $y = \frac{1}{2}x + 2$

b $y = 2x - 2$

c $y = -\frac{1}{2}x + 6$

d $y = -2x - 6$

11. Which of the following represents an equation of a line?

a $y = 2^x$

b $y = x^2 - 5$

c $x^2 + y^2 - 25 = 0$

d $2x + 3y - 5 = 0$

12. What are the slope, m, and y-intercept, b, of the line represented by $3x - 2y + 16 = 0$?

a $m = \frac{3}{2}, b = 8$

b $m = \frac{2}{3}, b = -16$

c $m = -\frac{2}{3}, b = -8$

d $m = -\frac{3}{2}, b = 16$

13. The following table shows values for a linear relation.

x	y
–15	–33
–9	–25
3	–9
12	3

Which of the following equations represents the relationship shown in the table of values?

a $y = \frac{4}{3}x - 16$

b $y = \frac{4}{3}x - 13$

c $y = \frac{3}{4}x - 9$

d $y = \frac{3}{4}x - 6$

14. The table of values below displays the cost of renting a bicycle.

Time, t (h)	Cost, C ($)
0	25
1	30
2	35
3	40

Which equation models the cost of renting a bicycle?

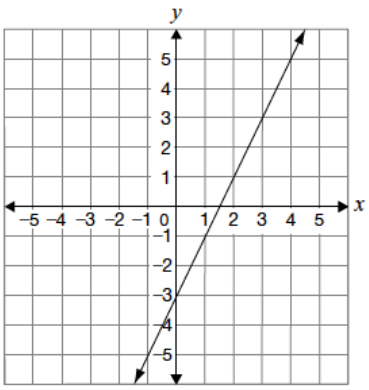
a $C = 5t$

b $C = 25t$

c $C = 5t + 25$

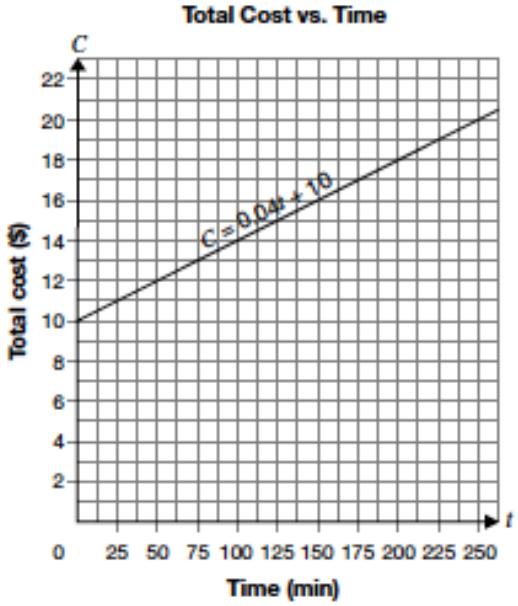
d $C = 25t + 5$

15. The graph of a line is shown below.



16. 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 $C = 15$

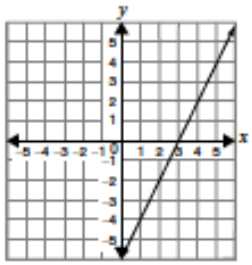
B $C = 0.02t + 11$

C $C = 0.03t + 9$

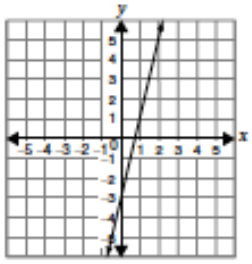
D $C = 0.05t + 8$

If the slope is doubled and the y-intercept remains constant, which graph below best represents the new line?

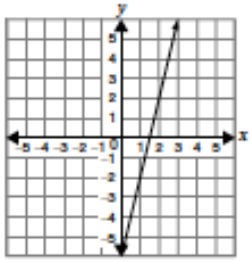
a



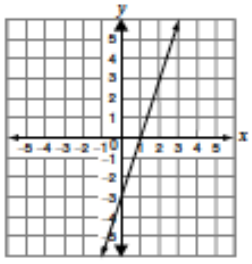
b



c



d



17. Which of the following statements is true for the line $5x - 2y - 12 = 0$?

a The slope is $\frac{2}{5}$ and the y-intercept is 12.

b The slope is -5 and the y-intercept is 6.

c The slope is 5 and the y-intercept is -12.

d The slope is $\frac{5}{2}$ and the y-intercept is -6.

18. For the slope of a line, the change in x is greater than the change in y. Which of the following could represent the slope of this line?

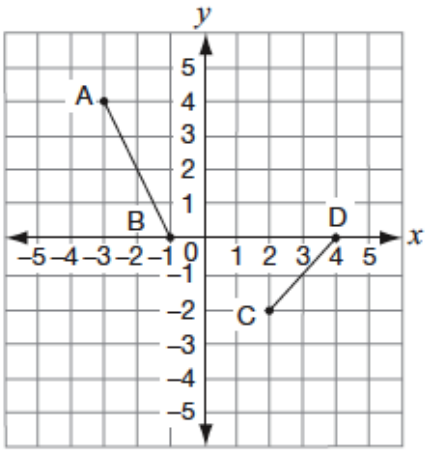
a $\frac{4}{3}$

b 2

c 1

d $\frac{2}{5}$

19. Consider the following graph.



Which statement is **false**?

a The slope of AB is -2.

b The slope of CD is 1.

c The y-intercept of the line through CD is -4.

d The y-intercept of the line through AB is -1.

20. The table below shows examples of linear and non-linear equations.

Equation Examples

Linear equations	Non-linear equations
$y = 5x - 3$	$y = 5x^2 - 3$
$y = 125 - 4.25x$	$y = 2x^3$
$y = -3x$	$2x^2 + 5y^2 = 10$

Which of these statements best describes how linear equations are different from non-linear equations in the table above?

a The exponent of both variables in the linear equations is 1.

b The exponent of exactly one variable in the linear equations is 1.

c The exponent of both variables in the non-linear equations is 1.

d The exponent of exactly one variable in the non-linear equations is 1.

21. Janelle draws a line that passes through the points $(-1, 6)$ and $(0, 3)$. If Janelle writes the equation of the line in $y = mx + b$ form, what are the values of m and b?

a $m = -9$
$b = 3$

b $m = -3$
$b = 6$

c $m = -9$
$b = 6$

d $m = -3$
$b = 3$

22. The total cost of hiring Beth's Plumbing Services is represented by the equation $C = 50t + 70$, where C is the total cost in dollars and t is the time in hours.

Next month, the rate will change to \$60 per hour, but the initial charge will stay the same.

Which of the following describes how the graph of the relation will change?

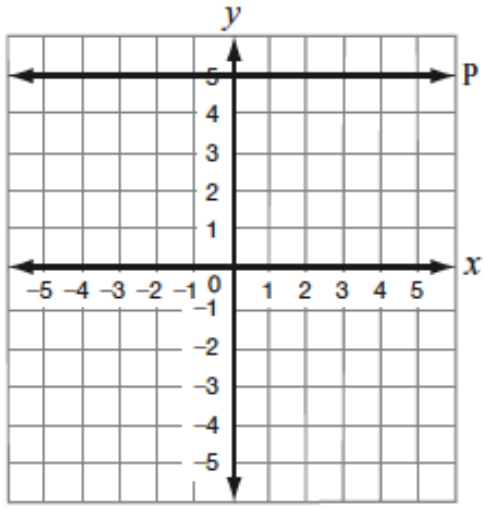
a The steepness of the line will increase.

b The steepness of the line will decrease.

c The vertical intercept will increase by 10 units.

d The vertical intercept will decrease by 10 units.

23. Line P is shown below.



Which equation represents Line P?

a $x = 5$

b $y = 5$

c $y = x + 5$

d $x = y + 5$

24. A bus is rented for a class field trip. The transportation cost for the trip is made up of \$225 to rent the bus, \$50 for gas and \$2 for each bus seat.

Which relation below describes the total transportation cost for the trip if C is the total cost in dollars and n is the number of seats?

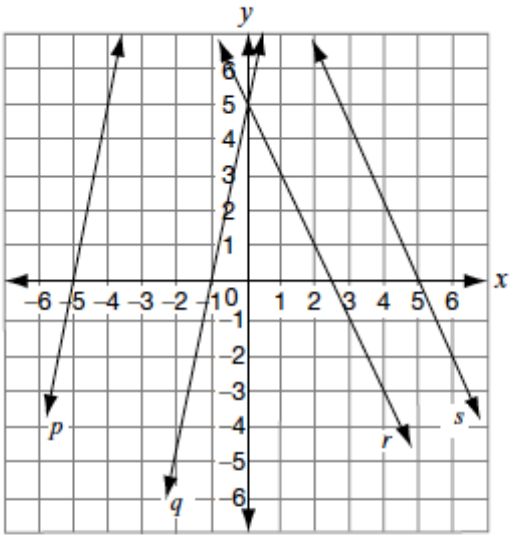
a $C = -2n + 225$

b $C = -2n + 275$

c $C = 2n + 225$

d $C = 2n + 275$

25. Consider the following linear relations.



Which line represents the graph of the equation $y = -2x + 5$?

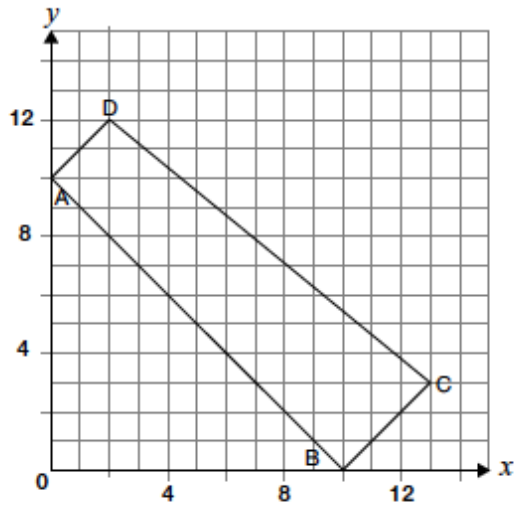
a Line p

b Line q

c Line r

d Line s

26. The following graph shows the quadrilateral ABCD.



Which of the following statements is **false**?

A AD is parallel to BC.

B DC is parallel to AB.

C CB is perpendicular to AB.

D DA is perpendicular to AB.

27. Identical bottles are packed in a box. The box will hold a maximum of 38 bottles. The relationship between M, the total mass of the box and its contents, and n, the number of bottles in the box, is represented by the equation $M = 500n + 800$.

Which of the following are possible integer values for the variable n?

a n is greater than 37.

b n is greater than or equal to 0.

c n is greater than 0 but less than 39.

d n is greater than or equal to 0 but less than 39.

28. A line has the following characteristics.

- It is perpendicular to the line $y = \frac{1}{2}x + 3$.
- It passes through the point (4, 0).

What are m, the slope, and b, the y-intercept, of the line?

A $m = \frac{1}{2}; b = 0$

B $m = \frac{1}{2}; b = 3$

C $m = -2; b = 0$

D $m = -2; b = 8$

29. Which of the following equations is **not** represented by a straight line on a graph?

A $x = 3y - 4$

B $y = -2x$

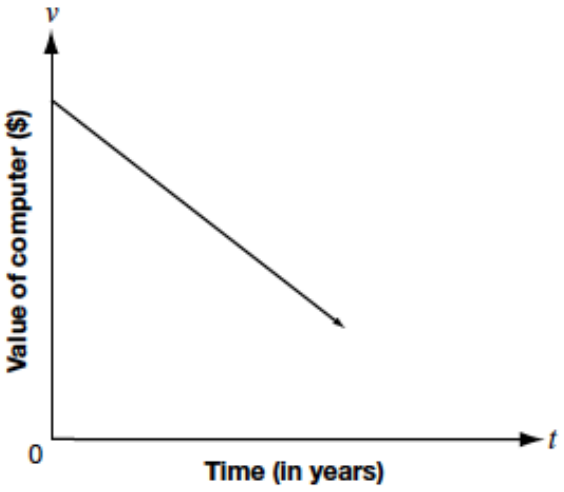
C $x = 4$

D $y = 2x^2 - 2$

31. A computer decreases in value over time. The relationship between the value of the computer, v, in dollars after t years is written as the 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

30. What is the equation of the line that passes through the points (2, 4) and (4, 0)?

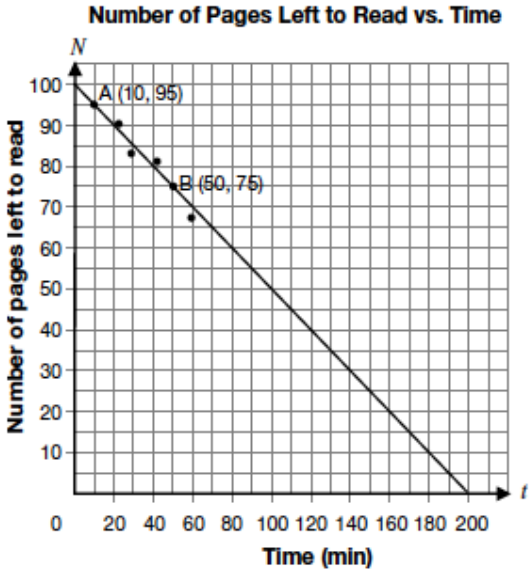
a $y = -\frac{1}{2}x + 2$

b $y = -\frac{1}{2}x + 5$

c $y = -2x + 4$

d $y = -2x + 8$

32. The following scatter plot shows the relationship between N, the number of pages in Annie's textbook that she has left to read, and t, the time in minutes she spends reading the book.



Which equation represents the line above?

A $N = -\frac{1}{2}t + 100$

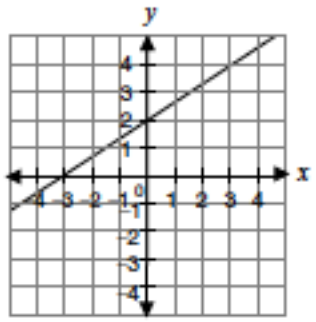
B $N = -\frac{1}{2}t + 200$

C $N = -t + 100$

D $N = -t + 200$

33. Which **graph** represents the relation $y = \frac{2}{3}x + 2$?

F



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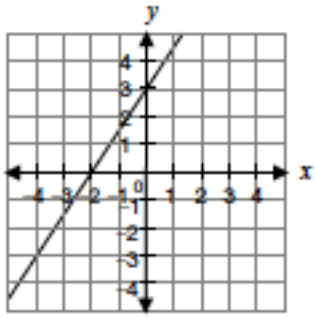

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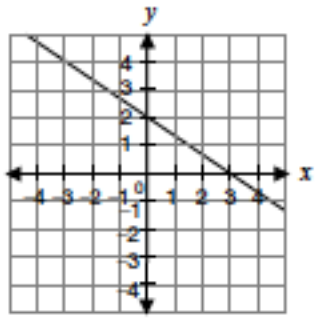

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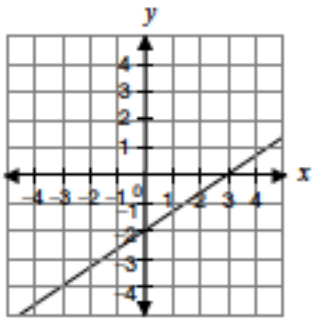
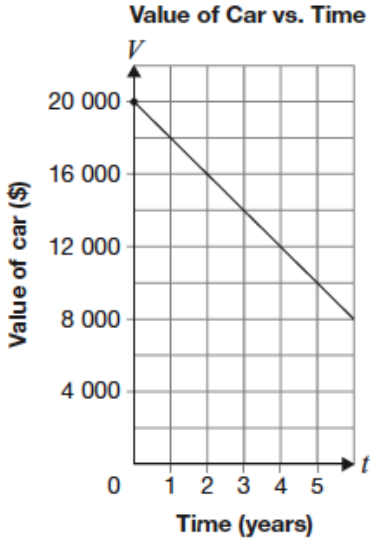


34. **Hot New Wheels**

Cybelle and Peter each buy a car. The graph below represents the value of Cybelle's car over time.



Peter's car costs less than Cybelle's. The value of both cars changes at the same rate.

Determine a possible equation to represent the relationship between the value of Peter's car, V, in dollars, and time, t, in years.

$V =$ _____

Justify your equation.

35. **The New Line**

A line has

- the same slope as the line represented by $4x - 3y + 15 = 0$ and
- the same y-intercept as the line represented by $2x + y + 6 = 0$.

Determine an equation of this line.

Show your work.

36. **Picture Perfect**

The cost of producing a family photo album is $0.50 per photo, plus a fixed cost for the album.

Circle the table below that represents this scenario.

Option 1

Number of photos, p	Cost, C
5	$2.50
10	$5.00
15	$7.50
20	$10.00

Option 2

Number of photos, p	Cost, C
5	$35.50
10	$36.00
15	$36.50
20	$37.00

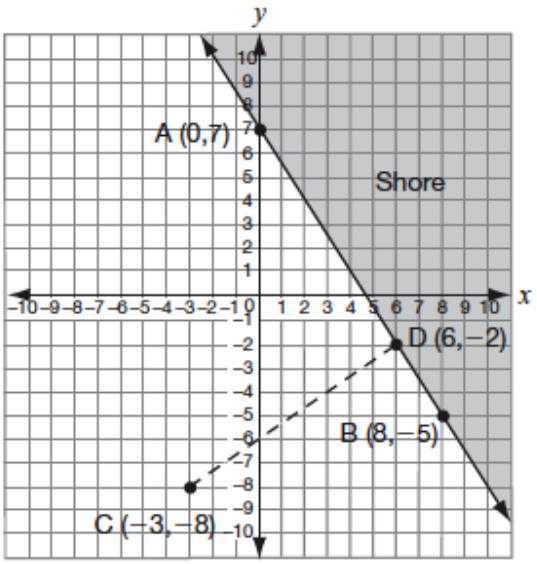
Option 3

Number of photos, p	Cost, C
5	$37.50
10	$40.00
15	$42.50
20	$45.00

Justify your choice and include an explanation of why you did not choose the other options.

37. **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.

38. ## What's the Charge?

The table below represents the linear relationship between cost and repair time at an appliance store.

Repair time, t (h)	Cost, C ($)
3	205
6	385
8	505

Determine the initial value of this relationship. Show your work.

Initial value: _____

Is this relationship a direct or a partial variation?

Circle one: Direct variation Partial variation

Justify your answer.

39. ## Getting Paid

Hannah's total pay includes a base salary and a percent of her sales.

The following table shows her total pay for three different sales levels.

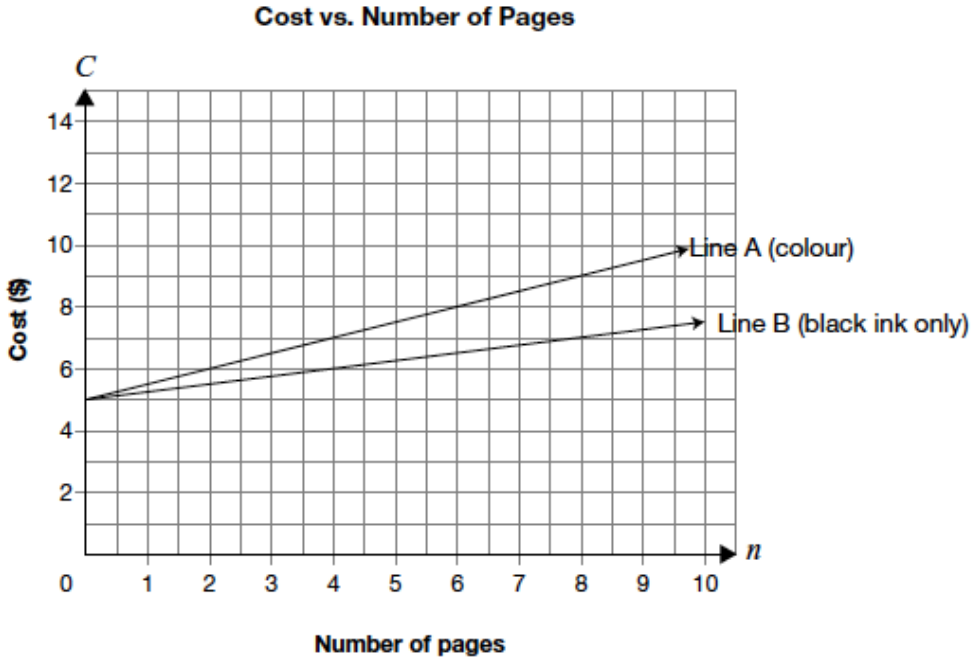
Sales ($)	Total pay ($)
15 000	1700
17 500	1825
28 000	2350

Determine Hannah's total pay when her sales are $47 000.

Show your work.

43. **To Colour or Not to Colour**

The graph below shows the cost to print a document at the Graphics Shop. Line A represents the cost of printing the document in colour. Line B represents the cost to print it with black ink only.



For a 500-page document, how much more will it cost to print in colour than with black ink only?

Show your work.