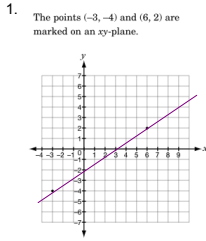


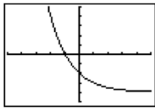
# Answers



- Which statement about the line through  $(-3, -4)$  and  $(6, 2)$  is **not true**?
- A Its  $x$ -intercept is 3.
  - B Its slope is positive.
  - C Its  $y$ -intercept is  $-2$ .
  - D It passes through  $(4, 9)$ .**

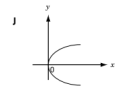
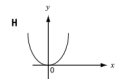
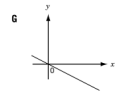
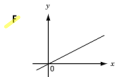
3. Given A  $(2, 5)$  and B  $(-6, 5)$ , which statement about the line segment AB is **true**?
- F** The slope of AB is zero.
  - G The slope of AB is positive.
  - H The slope of AB is negative.
  - J The slope of AB is undefined.

5. The graph below shows the display on Kalib's graphing calculator. The horizontal axis is the  $x$ -axis and the vertical axis is the  $y$ -axis.

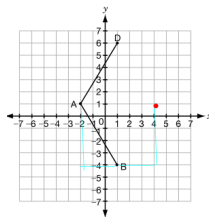


- Which statement describes the **change in  $y$  as  $x$  increases**?
- F  $y$  increases linearly.
  - G  $y$  decreases non-linearly.**
  - H  $y$  decreases linearly.
  - J  $y$  increases non-linearly.

2. Which graph below is likely the graph for  $y = 2x$ ?



4. A is the point  $(-2, 1)$ , B is the point  $(1, -4)$  and D is the point  $(1, 6)$ .



If ABCD is a rhombus, which of the following is **point C**?

- F  $(1, 1)$
- G  $(1, 4)$
- H  $(4, 1)$**
- J  $(4, 4)$

6. Demetrius's science class is performing an experiment. Demetrius fills a beaker with room temperature water. He slowly **heats** the water over a source of constant heat and records the **water temperature at different times** in the table below.



| Time elapsed, $x$ (min) | Water temperature, $y$ ( $^{\circ}\text{C}$ ) | First differences |
|-------------------------|---|-------------------|
| 2                       | 30  |                   |
| 4                       | 43  | 13                |
| 6                       | 54  | 11                |
| 8                       | 66  | 12                |
| 10                      | 77  | 11                |

- a) i) Complete the **first differences** column in the table of values above.  
 ii) Is the **relationship between the water temperature and the time elapsed** linear or non-linear?  
 Check one:  linear or  non-linear  
 Give reasons for your answer.  
**It is non-linear because first differences are not constant**

7. Inez created the following table of values based on a relationship between  $x$  and  $y$  and calculated the first differences. The values of  $y$  have been concealed.

| $x$ | $y$ | First differences |
|-----|-----|-------------------|
| 11  |     | -3                |
| 12  |     | -3                |
| 13  |     | -3                |
| 14  |     |                   |

Which statement describes the relationship between  $x$  and  $y$ ?

- a  $y$  increases linearly as  $x$  increases.
- b  $y$  decreases linearly as  $x$  increases.**
- c  $y$  increases non-linearly as  $x$  increases.
- d  $y$  decreases non-linearly as  $x$  increases.

9. Gerry has a table of values representing a linear relation. Two of the numbers are hidden behind a ketchup spill.

| $x$ | $y$ |
|-----|-----|
| -2  | -6  |
| -1  |     |
| 0   |     |
| 1   | 18  |

Handwritten calculations:  $2-8$ ,  $10-8$ ,  $18-8$ . A speech bubble says:  $18 - (-6) = 24$ ,  $24 \div 3 = 8$ .

The values that are hidden are

- a  $-2$  and  $14$ .
- b  $0$  and  $12$ .
- c  $-2$  and  $10$ .**
- d  $3$  and  $9$ .

8. The following tables express distance, in metres, as a function of time, in seconds. Which table represents a **linear** relation?

a

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 236          |
| 1        | 231          |
| 2        | 216          |
| 3        | 191          |

Handwritten notes:  $-5$ ,  $-15$ ,  $-25$

b

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 1            |
| 1        | 2            |
| 2        | 4            |
| 3        | 8            |

Handwritten notes:  $1$ ,  $2$ ,  $4$

c

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 28           |
| 1        | 46           |
| 2        | 50           |
| 3        | 64           |

Handwritten notes:  $4$ ,  $14$ ,  $14$

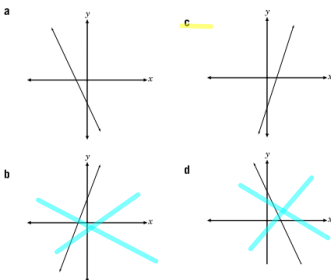
d

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 16           |
| 1        | 12           |
| 2        | 8            |
| 3        | 4            |

Handwritten notes:  $4$ ,  $4$ ,  $4$

10. Which of the following graphs best represents the line with

- a slope of 3 and
- a  $y$ -intercept of  $-22$ .



- 12.

The following tables express distance, in metres, as a function of time, in seconds.

Which table represents a **linear** relation?

a

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 236          |
| 1        | 231          |
| 2        | 216          |
| 3        | 191          |

b

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 1            |
| 1        | 2            |
| 2        | 4            |
| 3        | 8            |

c

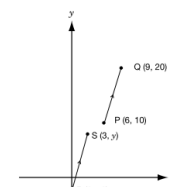
| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 28           |
| 1        | 46           |
| 2        | 50           |
| 3        | 64           |

d

| Time (s) | Distance (m) |
|----------|--------------|
| 0        | 16           |
| 1        | 12           |
| 2        | 8            |
| 3        | 4            |

Nov 25-10:09 PM

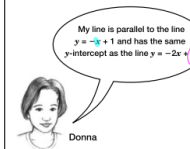
13. PQ and RS are parallel line segments. What is the value of  $y$ ?



- a 5
- b 6
- c 7
- d 8**

Handwritten calculations:  $-2y = 20 - 10$ ,  $0 - 3 = 9 - 6$ ,  $-2y = 10$ ,  $-3 = 3$ ,  $(-2) \div (-2) = 10 \div (-2)$ ,  $2xy = 10$ .

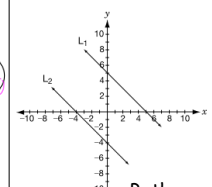
14. Donna has correctly drawn a line on an  $xy$ -plane.



Which of the following equations represents the line that Donna has drawn?

- a  $y = x + 6$
- b  $y = x + 6$**
- c  $y = -x + 6$
- d  $y = -x + 3$

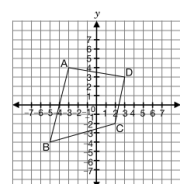
15. Which pair of equations best matches the lines shown on the graph?



- a  $L_1: y = x + 5$   
 $L_2: y = x - 4$
- b  $L_1: y = x + 5$   
 $L_2: y = -x + 4$**
- c  $L_1: y = -x + 5$   
 $L_2: y = x - 2$
- d  $L_1: y = -x + 5$   
 $L_2: y = -x - 4$

Both have negative slopes

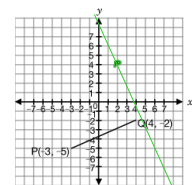
16. Four points, A, B, C and D, are marked on an  $xy$ -plane and joined by line segments as shown.



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

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

17. 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  $(4, 1)$

Nov 26-4:36 PM

# Answers

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

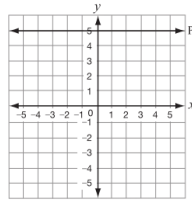
- ~~a  $y = -\frac{1}{2}x + 2$~~
- ~~b  $y = -\frac{1}{2}x + 5$~~
- c  $y = -2x + 4$
- d  $y = -2x + 8$

$$\frac{4-0}{2-4} = \frac{4}{-2} = -2$$

19. Identify the equation that represents the line with a y-intercept of 600 and a slope of 50.

- a  $y = 50x$
- b  $x = 600y$
- c  $y = 600x + 50$
- d  $y = 50x + 600$

20. Line P is shown below.



Which equation represents Line P?

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