

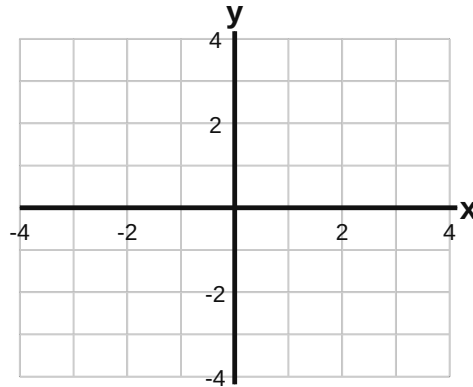
Boost Free Lessons - Year 8 Maths

Lesson 16: Graphing Linear Equations

Name: _____ Grade: _____ Date: _____

Worked Example 1

Complete a table of values for $y = 2x + 1$, then plot the points.



1. Substitute each x value into the equation, one at a time.
2. When $x = -1$: $y = 2(-1) + 1 = -1$.
3. When $x = 0$: $y = 1$. When $x = 1$: $y = 3$. When $x = 2$: $y = 5$.
4. Plot $(-1, -1)$, $(0, 1)$, $(1, 3)$ and $(2, 5)$, then rule a straight line through them.

The four points lie on one straight line

Worked Example 2

Does the point $(3, 7)$ lie on the line $y = 2x + 1$?

1. A point lies on a line only if it makes the equation true.
2. Substitute the x value of the point: $y = 2(3) + 1 = 7$.
3. The equation gives $y = 7$, and the point has $y = 7$, so they match.

Yes, $(3, 7)$ lies on the line

Remember: Every point on a line makes its equation true. Two points are enough to rule a line, but always plot a third as a check. The y -intercept is the value of y when $x = 0$.



Question 1: Find the y values for $x = -2, -1, 0, 1$ and 2 for each equation.

1. $y = x + 3$

2. $y = 2x$

3. $y = x - 4$

4. $y = 3x + 1$

5. $y = -x + 2$

6. $y = 2x - 3$



Question 2: Answer Yes or No for each, showing your working.

1. Does (2, 5) lie on $y = 2x + 1$?

2. Does (1, 4) lie on $y = 3x$?

3. Does (0, -2) lie on $y = x - 2$?

4. Does (4, 9) lie on $y = 2x + 1$?

5. Does (-1, 3) lie on $y = -2x + 1$?

6. Does (3, 5) lie on $y = x + 3$?

7. Does (5, 0) lie on $y = x - 5$?

8. Does (2, -1) lie on $y = 3x - 7$?



Question 3: Answer the following questions.

1. Find the y-intercept of the line $y = 4x - 3$.
2. A line passes through $(0, 2)$ and $(1, 5)$. Find its equation.
3. For the line $y = 5x - 2$, find y when $x = 3$.
4. For the line $y = 2x + 6$, find x when $y = 0$.
5. A phone plan costs $C = 20 + 5g$ dollars, where g is the number of gigabytes used. Find the cost for 6 GB, and explain what the 20 represents.



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Answers: Graphing Linear Equations**Question 1**

1. 1, 2, 3, 4, 5
2. -4, -2, 0, 2, 4
3. -6, -5, -4, -3, -2
4. -5, -2, 1, 4, 7
5. 4, 3, 2, 1, 0
6. -7, -5, -3, -1, 1

Question 2

1. Yes
2. No, $y = 3$ when $x = 1$
3. Yes
4. Yes
5. Yes
6. No, $y = 6$ when $x = 3$
7. Yes
8. Yes

Question 3

1. (0, -3)
2. $y = 3x + 2$
3. $y = 13$
4. $x = -3$
5. \$50. The 20 is the fixed monthly charge, paid before any data is used.

