

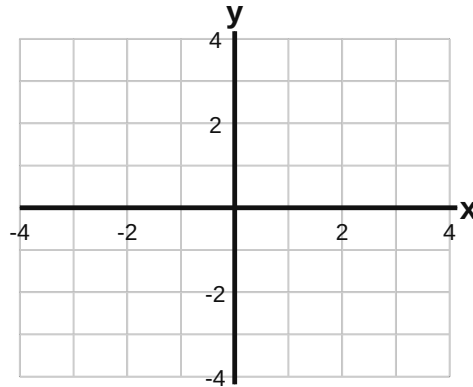
Boost Free Lessons - Year 9 Maths

Lesson 18: Graphing Linear Equations

Name: _____ Grade: _____ Date: _____

Worked Example 1

Graph $y = 2x - 3$ using a table of values.



1. Choose a few x values and substitute each one into the equation.
2. When $x = -1$: $y = 2(-1) - 3 = -5$. When $x = 0$: $y = -3$.
3. When $x = 1$: $y = -1$. When $x = 2$: $y = 1$.
4. Plot $(-1, -5)$, $(0, -3)$, $(1, -1)$ and $(2, 1)$, then rule a straight line through them.

The four points lie on one straight line

Worked Example 2

Graph $y = -x + 4$ using its intercepts.

1. For the y -intercept, let $x = 0$: $y = 4$, giving the point $(0, 4)$.
2. For the x -intercept, let $y = 0$: $0 = -x + 4$, so $x = 4$, giving the point $(4, 0)$.
3. Plot the two intercepts and rule a straight line through them.
4. This method is quicker than a table, but always check with a third point.

The line cuts the axes at $(0, 4)$ and $(4, 0)$

Remember: Two points are enough to rule a line, but always plot a third as a check. The intercept method is quickest: set $x = 0$ for one point and $y = 0$ for the other.



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

1. $y = x + 5$

2. $y = 3x$

3. $y = 2x + 1$

4. $y = -x + 3$

5. $y = 4x - 2$

6. $y = -2x + 1$



Question 2: Find the y-intercept and the x-intercept of each line.

1. $y = x + 4$

2. $y = 2x - 6$

3. $y = -x + 5$

4. $y = 3x + 9$

5. $y = 4x - 8$

6. $y = -2x + 10$

7. $y = 5x$

8. $y = -3x - 6$



Question 3: Answer the following questions.

1. Does the point (3, 5) lie on the line $y = 2x - 1$? Show your working.
2. Find where the line $y = 2x + 6$ crosses the x-axis.
3. A line has y-intercept (0, -2) and gradient 3. Write its equation, then find y when $x = 5$.
4. Describe the line $y = 4$ and state its gradient.
5. A phone plan costs $C = 15 + 4g$ dollars for g gigabytes. Find the cost for 5 GB and state what the C-intercept represents.





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Answers: Graphing Linear Equations**Question 1**

1. 3, 4, 5, 6, 7
2. -6, -3, 0, 3, 6
3. -3, -1, 1, 3, 5
4. 5, 4, 3, 2, 1
5. -10, -6, -2, 2, 6
6. 5, 3, 1, -1, -3

Question 2

1. (0, 4) and (-4, 0)
2. (0, -6) and (3, 0)
3. (0, 5) and (5, 0)
4. (0, 9) and (-3, 0)
5. (0, -8) and (2, 0)
6. (0, 10) and (5, 0)
7. (0, 0) for both
8. (0, -6) and (-2, 0)

Question 3

1. Yes, because $2(3) - 1 = 5$
2. (-3, 0)
3. $y = 3x - 2$, and $y = 13$ when $x = 5$
4. A horizontal line through (0, 4), with gradient 0
5. \$35. The C-intercept of 15 is the fixed monthly charge before any data is used.

