

Free Algebra Exercises

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Contents

1. Solving literal equations
2. Writing the equation of a line
3. Distance and mid-point
4. Graph lines
5. Radical expressions
6. Systems of Equations

1. Literal equations

(a) Solve $4q - 2p = 8$ for q .

(b) Solve $8x - 2y = 24$ for y .

(c) Solve $\frac{a+b}{3} = c$ for a .

(d) Solve $\frac{1}{2}x - 4 = y + 4$ for x .

(e) Solve $\frac{m-n}{k} = 3$ for q .

Answers:

(a) $q = \frac{1}{2}p + 2$

(b) $y = 4x - 12$

(c) $a = 3c - b$

(d) $x = 2y + 16$

(e) $n = m - 3k$

[<back2top>](#)

2. Writing the equation of a line

Write the equation of the line passing through the two points by first finding the slope, second picking one point together with slope to find the b or the y -intercept and finally putting it all together in slope intercept form: $y = mx + b$.

(a) $(0, -1)$ and $(1, 1)$

(b) $(1, -1)$ and $(-1, 5)$

(c) $(-2, 4)$ and $(2, 6)$

(d) $(-2, 3)$ and $(1, 4)$

Answers:

(a) $y = 2x - 1$

(b) $y = -3x + 2$

(c) $y = \frac{1}{2}x + 5$

(d) $y = \frac{1}{3}x + \frac{11}{3}$

[<back2top>](#)

3. Distance and mid-point

Using the distance and mid-point formulas from the supplement on Algebra, find the distance and mid-point of the following:

(a) $(-2, 1)$ and $(4, 3)$

(b) $(1, -3)$ and $(5, 5)$

(c) $(-6, -1)$ and $(3, 2)$

Answers:

(a) $d = 2\sqrt{10}$, $mp = (1, 2)$

(b) $d = 4\sqrt{5}$, $mp = (3, 1)$

(c) $d = 3\sqrt{10}$, $mp = (-\frac{3}{2}, \frac{1}{2})$

[<back2top>](#)

4. Graph lines

Graph the following lines using the y -intercept and slope.

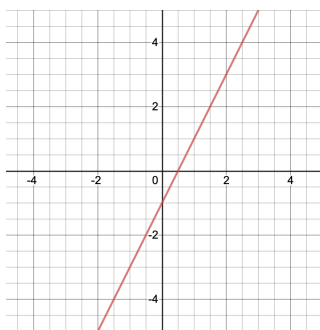
(a) $y = 2x - 1$

(b) $y = \frac{1}{3}x + 2$

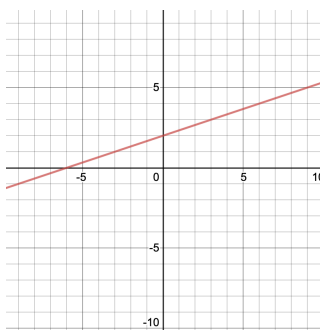
(c) $3y + 2x = -6$

Answers

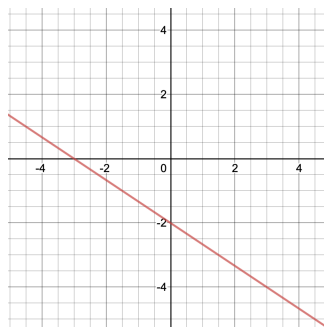
(a)



(b)



(c)



[<back2top>](#)

5. Radical Expressions

(a) $\sqrt{4a^2b^3c^4}$

(b) $\sqrt{50x^3y^2z}$

(c) $\sqrt[3]{27pq^3r^5}$

(d) $\sqrt[3]{125m^3n^4k^6}$

(e) $\sqrt[4]{16a^4b^5c^8}$

Answers:

(a) $2abc^2\sqrt{b}$

(b) $5xy\sqrt{2xz}$

(c) $3qr\sqrt[3]{pr^2}$

(d) $5mnk^2\sqrt[3]{n}$

(e) $2abc^2\sqrt[4]{b}$

[<back2top>](#)

6. Systems of equations

Solve the following systems using substitution:

(a)

$$\begin{cases} y = 4x - 9 \\ y = x - 3 \end{cases}$$

(b)

$$\begin{cases} 2x + y = 5 \\ x - y = 13 \end{cases}$$

Answers

(a) $(2, -1)$

(b) $(6, -7)$

Solve the following systems using elimination:

(a)

$$\begin{cases} x - 2y = 4 \\ x + 6y = -4 \end{cases}$$

(b)

$$\begin{cases} 8x - 6y = -20 \\ -16x + 7y = 30 \end{cases}$$

Answers

(a) $(2, -1)$

(b) $(-1, 2)$

[<back2top>](#)