Algebra 2 IB
Summer Math Assignment
ANSWER KEY

Use Khan Academy as a resource for help. There are videos explaining the objectives in this packet that you are required to know. www.khanacademy.org

Remember, there will be a **test** on these Algebra 1 objectives at the **beginning** of the school year!

Order of Operations

Evaluate each expression.

1) $(30 - 3) \div 3$

9

2) $(21 - 5) \div 8$

2

3) $1 + 7^2$

50

4) $5 \times 4 - 8$

12

5) $8 + 6 \times 9$

62

6) $3 + 17 \times 5$

88

7) $7 + 12 \times 11$

139

8) $15 + 40 \div 20$

17

9) $20 + 16 - 15$

21

10) $19 - 15 - 3$

1

11) $9 \times (3 + 3) \div 6$

9

12) $(9 + 18 - 3) \div 8$

3

13) $9 + 6 \div (8 - 2)$

10

14) $4(4 \div 2 + 4)$

24

15) $6 + (5 + 8) \times 4$

58

16) $6 \times 6 - (7 + 5)$

24

17) $(9 \times 2) \div (2 + 1)$

6

18) $2 - (4 + 3 - 6)$

1

19) $7 \times 7 - (8 - 2)$

43

20) $9 - 7 - 6 \div 6$

1

21) $(4 - 1 + 8 \div 8) \times 5$

20

22) $(10 \times 2) \div (1 + 1)$

10

23) $7 \times 9 - 7 - 3 \times 5$

41

24) $8 - 1 - (18 - 2) \div 8$

5

Properties of Exponents

Simplify. Your answer should contain only positive exponents.

1) $2m^2 \cdot 2m^3$

$4m^5$

2) $m^4 \cdot 2m^{-3}$

$2m$

3) $4r^{-3} \cdot 2r^2$

$\frac{8}{r}$

4) $4n^4 \cdot 2n^{-3}$

$8n$

5) $2k^4 \cdot 4k$

$8k^5$

6) $2x^3y^{-3} \cdot 2x^{-1}y^3$

$4x^2$

7) $2y^2 \cdot 3x$

$6y^2x$

8) $4v^3 \cdot vu^2$

$4v^4u^2$

9) $4a^3b^2 \cdot 3a^{-4}b^{-3}$

$\frac{12}{ab}$

10) $x^2y^{-4} \cdot x^3y^2$

$\frac{x^5}{y^2}$

11) $(x^2)^0$

1

12) $(2x^2)^{-4}$

$\frac{1}{16x^8}$

13) $(4r^0)^4$

256

14) $(4a^3)^2$

$16a^6$

15) $(3k^4)^4$

$81k^{16}$

16) $(4xy)^{-1}$

$\frac{1}{4xy}$

17) $(2b^4)^{-1}$

$\frac{1}{2b^4}$

18) $(x^2y^{-1})^2$

$\frac{x^4}{y^2}$

19) $(2x^4y^{-3})^{-1}$

$\frac{y^3}{2x^4}$

20) $(3m)^{-2}$

$\frac{1}{9m^2}$

21) $\frac{r^2}{2r^3}$

$\frac{1}{2r}$

22) $\frac{x^{-1}}{4x^4}$

$\frac{1}{4x^5}$

23) $\frac{3n^4}{3n^3}$

n

24) $\frac{m^4}{2m^4}$

$\frac{1}{2}$

25) $\frac{3m^{-4}}{m^3}$

$\frac{3}{m^7}$

26) $\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4}$

$\frac{2x^2}{3yz^7}$

27) $\frac{4x^0y^{-2}z^3}{4x}$

$\frac{z^3}{y^2x}$

28) $\frac{2h^3j^{-3}k^4}{3jk}$

$\frac{2h^3k^3}{3j^4}$

29) $\frac{4m^4n^3p^3}{3m^2n^2p^4}$

$\frac{4m^2n}{3p}$

30) $\frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0}$

$\frac{3x^7}{yz}$

More Properties of Exponents

Simplify. Your answer should contain only positive exponents.

1) $\left(x^{-2}x^{-3}\right)^4$

$\frac{1}{x^{20}}$

2) $\left(x^4\right)^{-3} \cdot 2x^4$

$\frac{2}{x^8}$

3) $\left(n^3\right)^3 \cdot 2n^{-1}$

$2n^8$

4) $(2v)^2 \cdot 2v^2$

$8v^4$

5) $\frac{2x^2y^4 \cdot 4x^2y^4 \cdot 3x}{3x^{-3}y^2}$

$8x^8y^6$

6) $\frac{2y^3 \cdot 3xy^3}{3x^2y^4}$

$\frac{2y^2}{x}$

7) $\frac{x^3y^3 \cdot x^3}{4x^2}$

$\frac{x^4y^3}{4}$

8) $\frac{3x^2y^2}{2x^{-1} \cdot 4yx^2}$

$\frac{3xy}{8}$

9) $\frac{x}{\left(2x^0\right)^2}$

$\frac{x}{4}$

10) $\frac{2m^{-4}}{\left(2m^{-4}\right)^3}$

$\frac{m^8}{4}$

11) $\dfrac{(2m^2)^{-1}}{m^2}$

$\dfrac{1}{2m^4}$

12) $\dfrac{2x^3}{(x^{-1})^3}$

$2x^6$

13) $(a^{-3}b^{-3})^0$

1

14) $x^4y^3 \cdot (2y^2)^0$

x^4y^3

15) $ba^4 \cdot (2ba^4)^{-3}$

$\dfrac{1}{8b^2a^8}$

16) $(2x^0y^2)^{-3} \cdot 2yx^3$

$\dfrac{x^3}{4y^5}$

17) $\dfrac{2k^3 \cdot k^2}{k^{-3}}$

$2k^8$

18) $\dfrac{(x^{-3})^4x^4}{2x^{-3}}$

$\dfrac{1}{2x^5}$

19) $\dfrac{(2x)^{-4}}{x^{-1} \cdot x}$

$\dfrac{1}{16x^4}$

20) $\dfrac{(2x^3z^2)^3}{x^3y^4z^2 \cdot x^{-4}z^3}$

$\dfrac{8x^{10}z}{y^4}$

21) $\dfrac{(2pm^{-1}q^0)^{-4} \cdot 2m^{-1}p^3}{2pq^2}$

$\dfrac{m^3}{16p^2q^2}$

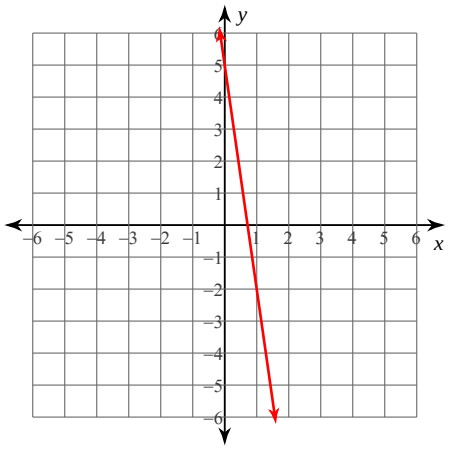
22) $\dfrac{(2hj^2k^{-2} \cdot h^4j^{-1}k^4)^0}{2h^{-3}j^{-4}k^{-2}}$

$\dfrac{h^3j^4k^2}{2}$

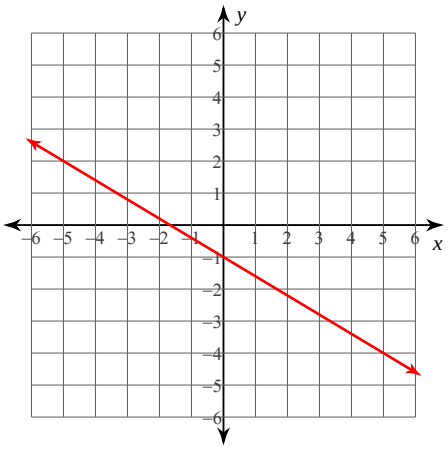
Graphing Lines

Sketch the graph of each line.

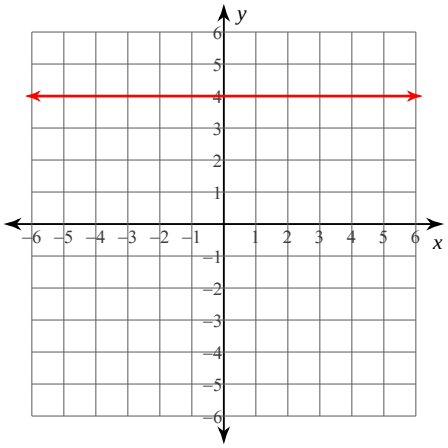
1) $7x + y = 5$



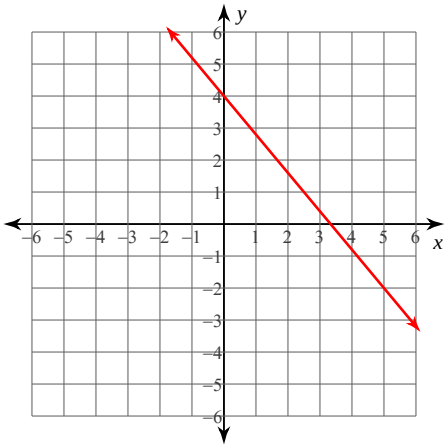
2) $3x + 5y = -5$



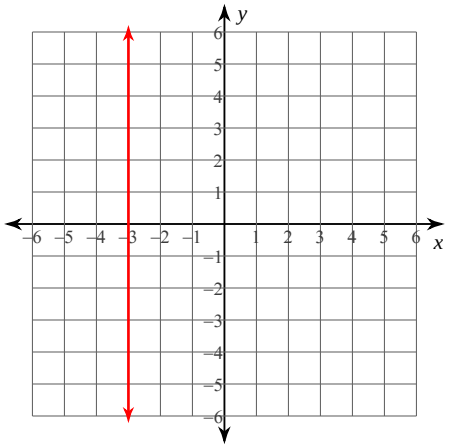
3) $y = 4$



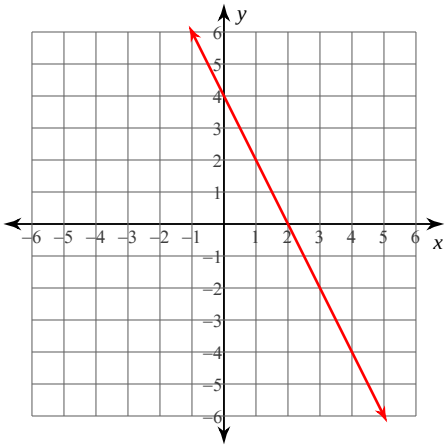
4) $6x + 5y = 20$



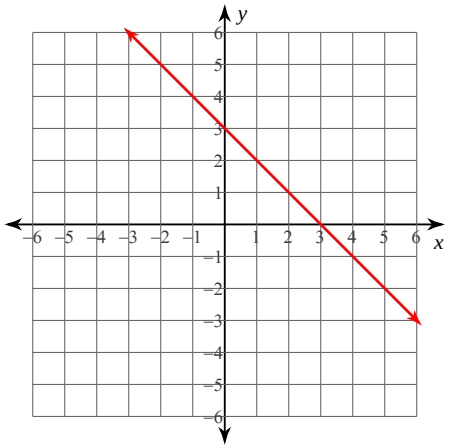
5) $x = -3$



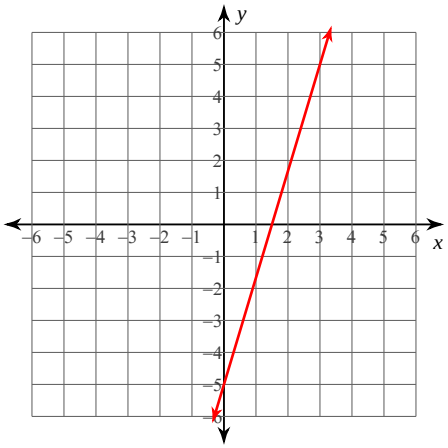
6) $2x + y = 4$



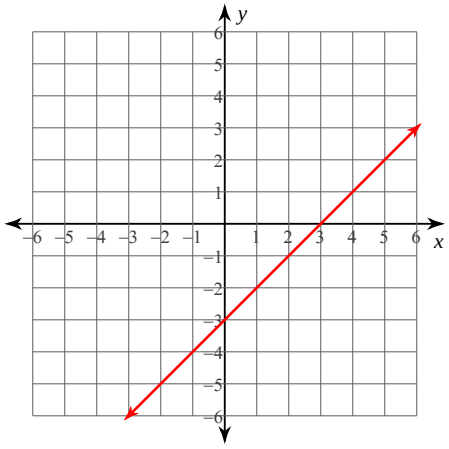
7) $x + y = 3$



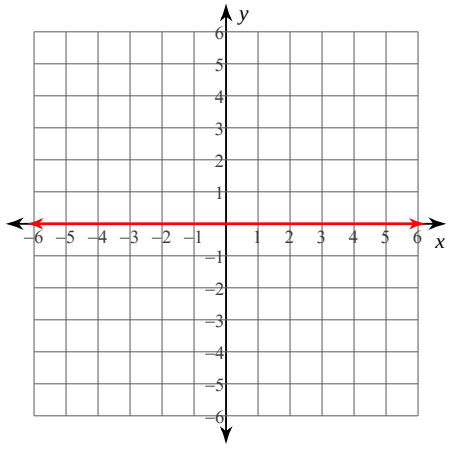
8) $10x - 3y = 15$



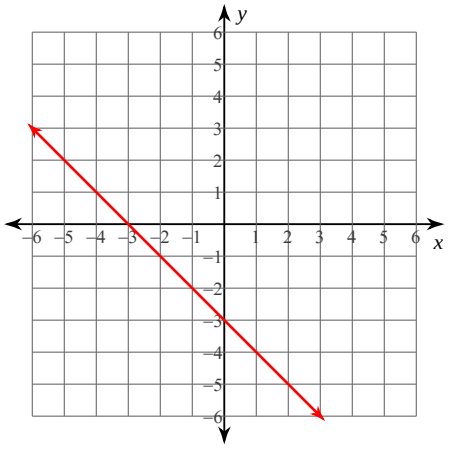
9) $x - y = 3$



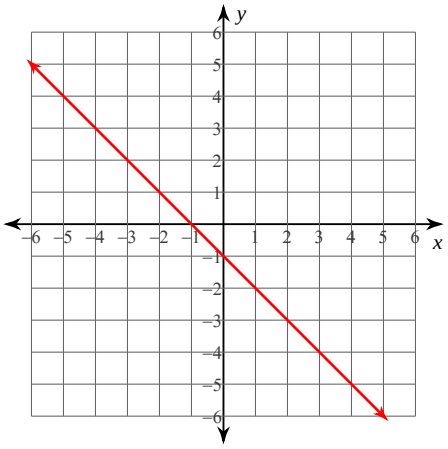
10) $y = 0$



11) $x + y = -3$



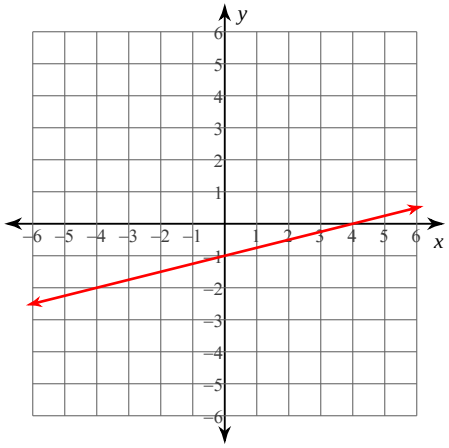
12) $x + y = -1$



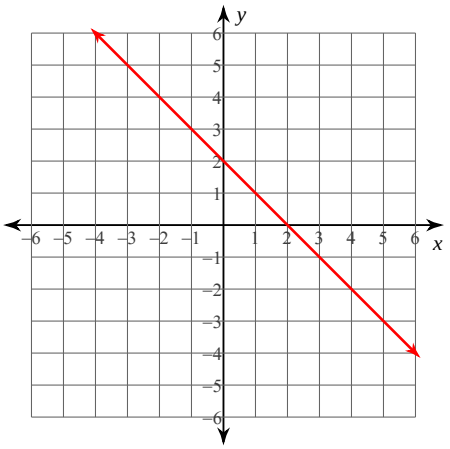
Graphing Lines in Slope-Intercept Form

Sketch the graph of each line.

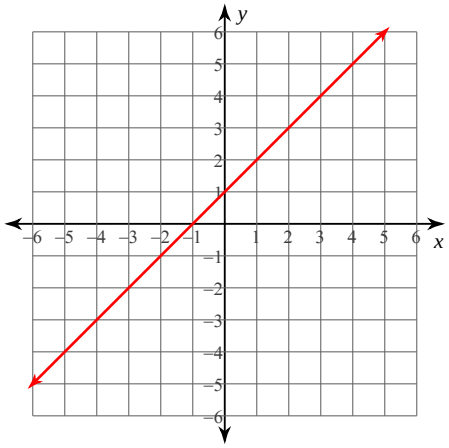
1) $y = \frac{1}{4}x - 1$



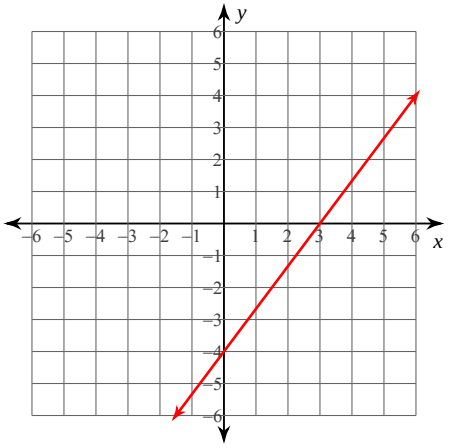
2) $y = -x + 2$



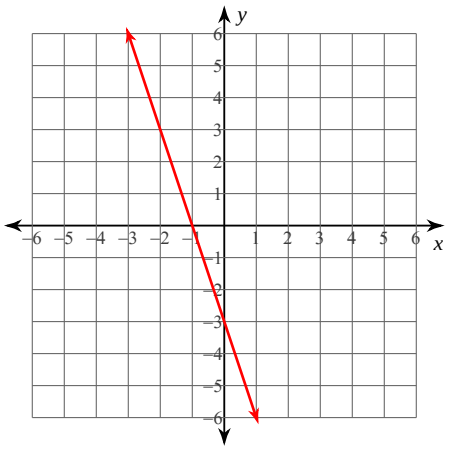
3) $y = x + 1$



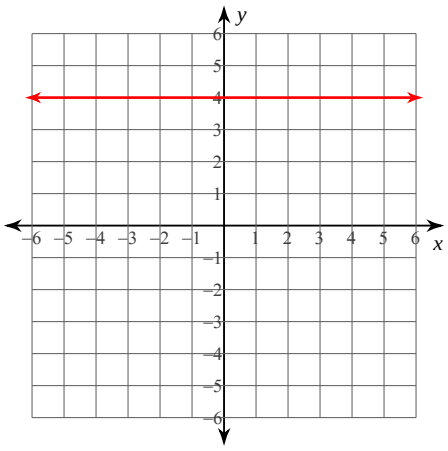
4) $y = \frac{4}{3}x - 4$



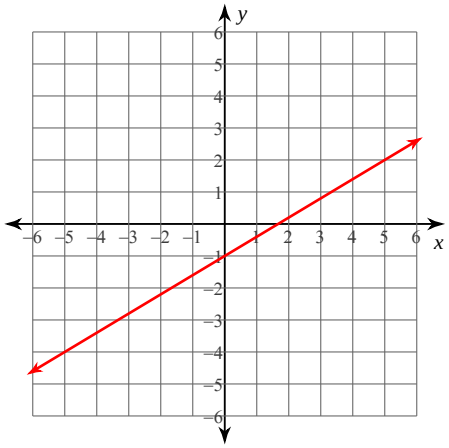
5) $y = -3x - 3$



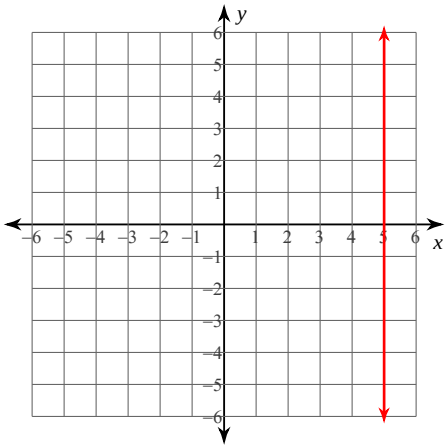
6) $y = 4$



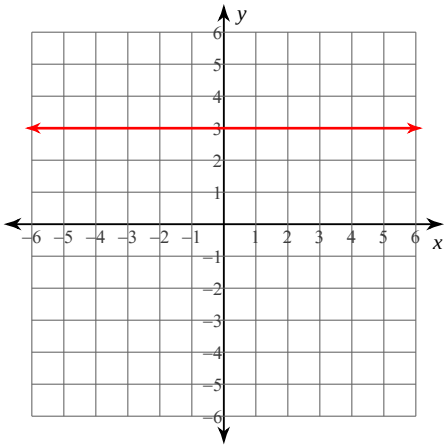
7) $y = \frac{3}{5}x - 1$



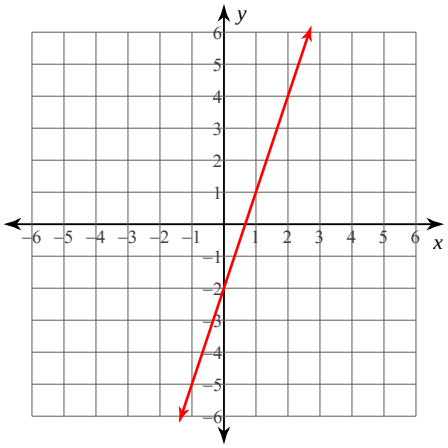
8) $x = 5$



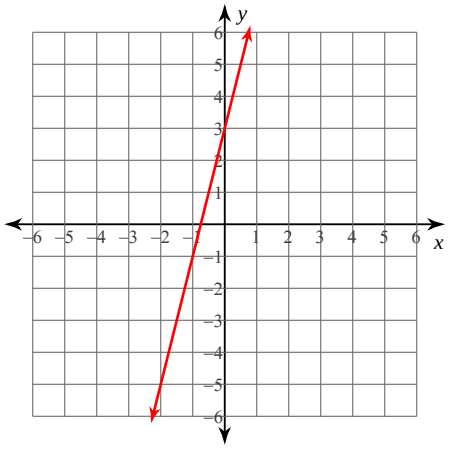
9) $y = 3$



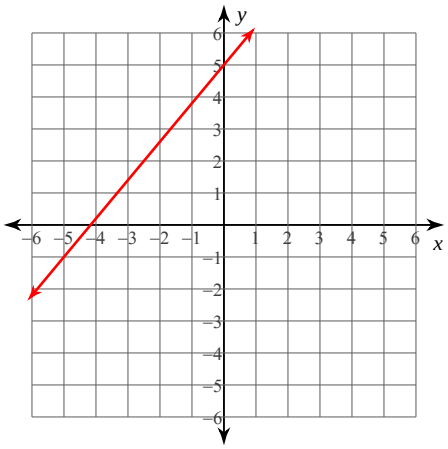
10) $y = 3x - 2$



11) $y = 4x + 3$

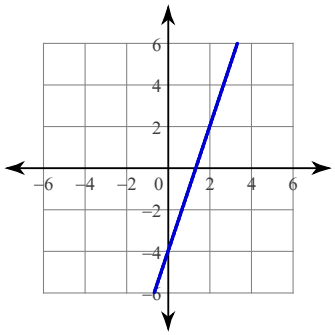


12) $y = \frac{6}{5}x + 5$



Answers to Graphing Linear Equations Using a Table of Values

1)



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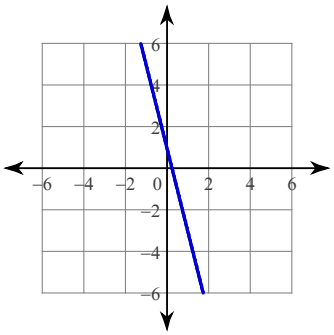

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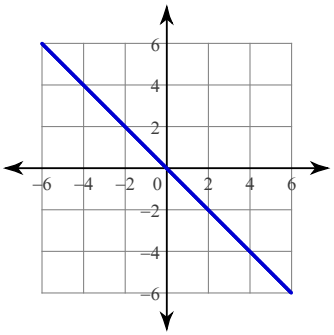

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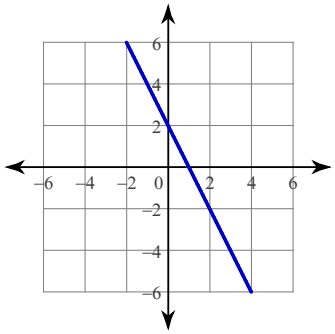

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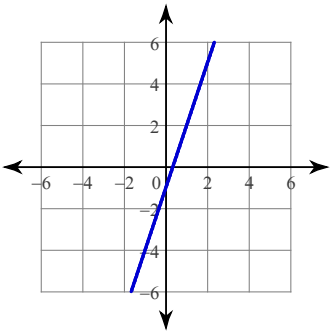

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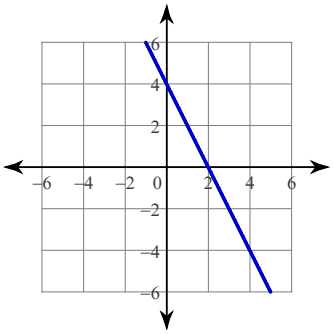

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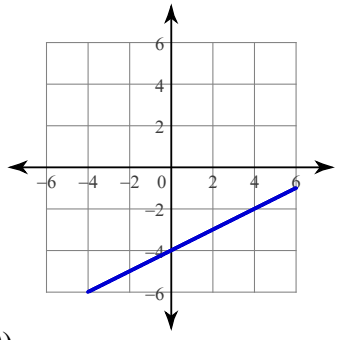
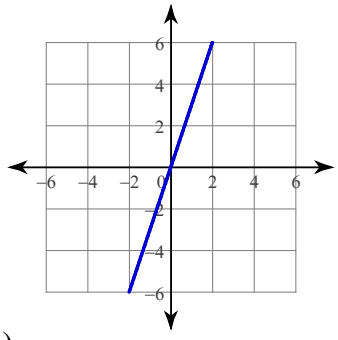


8)



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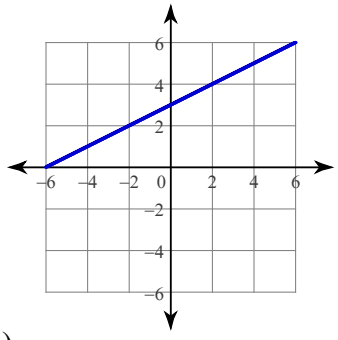

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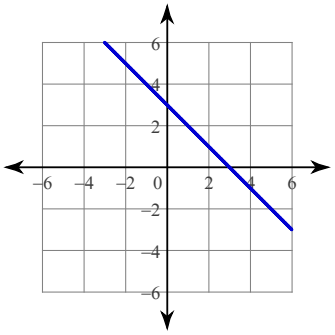

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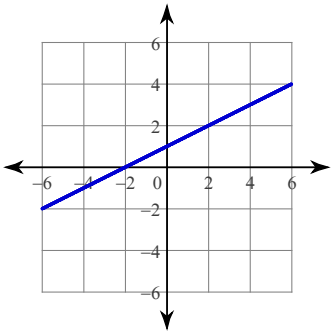

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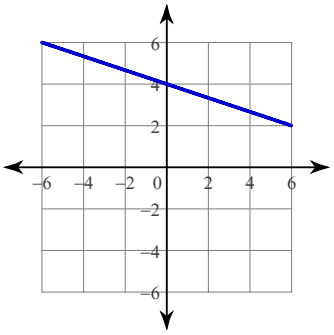

Solving Systems of Equations by Substitution

1) $5x - 4y = -23$

$-5x + 9y = 8$

(-7,-3)

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

$y = 5$

(4,5)

3) $8x + 3y = -9$

$6x = -18$

(-3,5)

4) $y = -\frac{2}{5}x - 4$

$y = \frac{9}{5}x + 7$

(-5,-2)

5) $y = -3x - 15$

$y = \frac{1}{4}x - 2$

(-4,-3)

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

$y = -\frac{7}{5}x - 3$

(0,-3)

7) $-5x + 9y = -12$

$3x + 2y = 22$

(6,2)

8) $y = -3x - 3$

$y = -3$

(0,-3)

9) $-3x - y = -24$

$y = 3x$

(4,12)

10) $y = x - 8$

$y = -4$

(4,-4)

Solving Systems of Equations by Elimination

1) $y = \frac{5}{3}x - 1$

$y = -6$

(-3,-6)

2) $x + y = 7$

$x - y = 3$

(5,2)

3) $4x + 6y = -6$

$6y = 18$

(-6,3)

4) $y = -6x - 3$

$y = -x + 2$

(-1,3)

5) $y = -\frac{2}{5}x - 4$

$y = \frac{9}{5}x + 7$

(-5,-2)

6) $2x + y = -3$

$-3x + 2y = -8$

(2/7, -25/7)

7) $y = \frac{5}{2}x - 4$

$y = -x + 3$

(2,1)

8) $y = \frac{7}{2}x - 5$

$y = -5$

(0,-5)

9) $9x - 2y = 19$

$7x = 21$

(3,4)

10) $-3x + 2y = -5$

$3x = 21$

(7,8)

Solving Systems of Equations Using Any Method

1) $y = 2x - 15$

$y = 5x$

(-5,-25)

2) $5x + 2y = 21$

$-x - y = -9$

(1,8)

3) $y = \frac{7}{2}x - 5$

$y = -5$

(0,-5)

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

$y = 5$

(4,5)

5) $3x + 23y = -4$

$5x = 20$

(4, -16/23)

6) $-x + 5y = -16$

$-3x + 7y = -8$

(-9,-5)

7) $x - 2y = 15$

$2x + 3y = 2$

(7,-4)

8) $y = -2x + 2$

$y = \frac{1}{3}x - 5$

(3,-4)

9) $y = \frac{3}{5}x - 5$

$y = -\frac{1}{3}x + 7$

(90/7, 19/7)

10) $y = -\frac{1}{4}x + 6$

$y = 4$

(8,4)

Factoring Trinomials (a = 1)
ANSWER KEY

Factor each completely.

1) $b^2 + 8b + 7$

$(b + 7)(b + 1)$

2) $n^2 - 11n + 10$

$(n - 10)(n - 1)$

3) $m^2 + m - 90$

$(m - 9)(m + 10)$

4) $n^2 + 4n - 12$

$(n - 2)(n + 6)$

5) $n^2 - 10n + 9$

$(n - 1)(n - 9)$

6) $b^2 + 16b + 64$

$(b + 8)^2$

7) $m^2 + 2m - 24$

$(m + 6)(m - 4)$

8) $x^2 - 4x + 24$

Not factorable

9) $k^2 - 13k + 40$

$(k - 5)(k - 8)$

10) $a^2 + 11a + 18$

$(a + 2)(a + 9)$

11) $n^2 - n - 56$

$(n + 7)(n - 8)$

12) $n^2 - 5n + 6$

$(n - 2)(n - 3)$

13) $b^2 - 6b + 8$

$(b - 4)(b - 2)$

14) $n^2 + 6n + 8$

$(n + 2)(n + 4)$

15) $2n^2 + 6n - 108$

$2(n + 9)(n - 6)$

16) $5n^2 + 10n + 20$

$5(n^2 + 2n + 4)$

17) $2k^2 + 22k + 60$

$2(k + 5)(k + 6)$

18) $a^2 - a - 90$

$(a - 10)(a + 9)$

19) $p^2 + 11p + 10$

$(p + 10)(p + 1)$

20) $5v^2 - 30v + 40$

$5(v - 2)(v - 4)$

21) $2p^2 + 2p - 4$

$2(p - 1)(p + 2)$

22) $4v^2 - 4v - 8$

$4(v + 1)(v - 2)$

23) $x^2 - 15x + 50$

$(x - 10)(x - 5)$

24) $v^2 - 7v + 10$

$(v - 5)(v - 2)$

25) $p^2 + 3p - 18$

$(p - 3)(p + 6)$

26) $6v^2 + 66v + 60$

$6(v + 10)(v + 1)$

Factoring By Grouping
ANSWER KEY

Factor each completely.

1) $8r^3 - 64r^2 + r - 8$

$(8r^2 + 1)(r - 8)$

2) $12p^3 - 21p^2 + 28p - 49$

$(3p^2 + 7)(4p - 7)$

3) $12x^3 + 2x^2 - 30x - 5$

$(2x^2 - 5)(6x + 1)$

4) $6v^3 - 16v^2 + 21v - 56$

$(2v^2 + 7)(3v - 8)$

5) $63n^3 + 54n^2 - 105n - 90$

$3(3n^2 - 5)(7n + 6)$

6) $21k^3 - 84k^2 + 15k - 60$

$3(7k^2 + 5)(k - 4)$

7) $25v^3 + 5v^2 + 30v + 6$

$(5v^2 + 6)(5v + 1)$

8) $105n^3 + 175n^2 - 75n - 125$

$5(7n^2 - 5)(3n + 5)$

9) $96n^3 - 84n^2 + 112n - 98$

$2(6n^2 + 7)(8n - 7)$

10) $28v^3 + 16v^2 - 21v - 12$

$(4v^2 - 3)(7v + 4)$

11) $4v^3 - 12v^2 - 5v + 15$

$(4v^2 - 5)(v - 3)$

12) $49x^3 - 35x^2 + 56x - 40$

$(7x^2 + 8)(7x - 5)$

13) $24p^3 + 15p^2 - 56p - 35$

$(3p^2 - 7)(8p + 5)$

14) $24r^3 - 64r^2 - 21r + 56$

$(8r^2 - 7)(3r - 8)$

15) $56xw + 49xk^2 - 24yw - 21yk$

$^2(7x - 3y)(8w + 7k^2)$

16) $42mc + 36md - 7n^2c - 6n^2$

$d(6m - n^2)(7c + 6d)$

17) $12x^2u + 3x^2v + 28yu + 7$

$yv(3x^2 + 7y)(4u + v)$

18) $40ac^2 + 25ak^2 + 32bc^2 + 20bk$

$^2(5a + 4b)(8c^2 + 5k^2)$

19) $12bc - 4bd - 15xc + 5xd$

$(4b - 5x)(3c - d)$

20) $16mn - 4m^2 + 28n - 7m$

$(4m + 7)(4n - m)$

21) $56xy - 35x + 16ry - 10r$

$(7x + 2r)(8y - 5)$

22) $21xy + 15x + 35ry + 25r$

$(3x + 5r)(7y + 5)$

23) $5a^2z - 4a^2c + 15xz -$

$12xc\ (a^2 + 3x)(5z - 4c)$

24) $4xy + 6 - x - 24y$

$(x - 6)(4y - 1)$

25) $21xy - 12b^2 + 14xb - 18by$

$(7x - 6b)(3y + 2b)$

26) $9mz - 4nc + 3mc - 12nz$

$(3m - 4n)(3z + c)$

27) $28xy + 25 + 35x + 20y$

$(7x + 5)(4y + 5)$

28) $30uv + 30u + 36u^2 + 25v$

$(6u + 5)(5v + 6u)$

Factoring Special Cases

Factor each completely.

1) $16n^2 - 9$

$(4n + 3)(4n - 3)$

2) $4m^2 - 25$

$(2m + 5)(2m - 5)$

3) $16b^2 - 40b + 25$

$(4b - 5)^2$

4) $4x^2 - 4x + 1$

$(2x - 1)^2$

5) $9x^2 - 1$

$(3x + 1)(3x - 1)$

6) $n^2 - 25$

$(n + 5)(n - 5)$

7) $n^4 - 100$

$(n^2 + 10)(n^2 - 10)$

8) $a^4 - 9$

$(a^2 + 3)(a^2 - 3)$

9) $k^4 - 36$

$(k^2 + 6)(k^2 - 6)$

10) $n^4 - 49$

$(n^2 + 7)(n^2 - 7)$

11) $98n^2 - 200$

$2(7n + 10)(7n - 10)$

12) $3 + 6b + 3b^2$

$3(1 + b)^2$

13) $400 - 36v^2$

$4(10 + 3v)(10 - 3v)$

14) $100x^2 + 180x + 81$

$(10x + 9)^2$

15) $10n^2 + 100n + 250$

$10(n + 5)^2$

16) $49n^2 - 56n + 16$

$(7n - 4)^2$

17) $49x^2 - 100$

$(7x + 10)(7x - 10)$

18) $1 - r^2$

$(1 + r)(1 - r)$

19) $10p^3 - 1960p$

$10p(p + 14)(p - 14)$

20) $343b^2 - 7b^4$

$7b^2(7 + b)(7 - b)$

21) $81v^4 - 900v^2$

$9v^2(3v + 10)(3v - 10)$

22) $200m^4 + 80m^3 + 8m^2$

$8m^2(5m + 1)^2$