Learning Center

Schoolcraft College

Jump Start

Session 2

Addition and Subtraction of Integers

When opposites are added, the result is _____.

Ex:

$-10 + 10 =$ $25 - 25 =$ $-93 + 93 =$

Adding integers:

Are they working together or fighting? If signs are the same _____ and keep the _____. If the signs are different, _____ and keep the sign of the _____.

Ex:

$12 - 2 =$ $-45 + 20 =$ $-75 - 280 =$

Note: Double negatives can be rewritten

Ex:

$7 - (-3) =$ $-10 - (-10) =$

Multiplication and Division of Integers

Remember these:

Ex:

$-24 \div 4 =$ $10 \cdot -5 =$

$(-3)^2 =$ $-2(-50) =$

$\frac{-28}{0} =$ $\frac{0}{-28} =$

Order of Operations with Integers

P_____

E_____

M/D_____

A/S_____

Simplify

$(6-8)3^2$

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

$-65 \div 5 + 2^3$

$(-2)^2 + 13 - (-7)$

$5-(-6)+3-16$

$\frac{-7(3^2-1)}{4(1-2^4)}$

$\frac{5(2^3-3^2)-5}{4-10 \div 5+3}$

Combining Like Terms

You can only add or subtract terms that are (exactly) alike

Combine like terms:

$3x + 2x$ $a + a$ $2y - 12y^2 + y - y^2 =$

Multiplying Expressions

Distribute to clear parenthesis

$4 \cdot 5n =$ $-4x \cdot 9x =$ $-3(-4x) =$

$9(-5y) =$ $5(2x + 3) =$ $7(8 - 4x) =$

$5(x + 1) - 3x =$ $2n - 4(8 - 3n) =$

Evaluating Expressions

Replace the variables with the given values. Then simplify using order of operations. Parentheses help keep everything organized.

Ex: Evaluate $4x + 3y + z$ for $x = 9$, $y = 5$, and $z = -8$

Ex: Evaluate $2x - y^2 + 6x^2$ for $x = 3$ and $y = -2$

Ex: Evaluate $\frac{y^2-4x}{y^2+2z}$ for $x = -3$, $y = 4$, and $z = 5$

Using Formulas

This is an application of evaluating expressions

Ex: The height of a thrown ball is given by the formula $h = -5t^2 + 16t + 2$. Find the height of the ball at $t = 2$ seconds after it is thrown

Ex: The surface area of a rectangular prism (box) is given by the formula $A = 2LW + 2WH + 2LH$. Find the surface area when length is 2 m, width is 3m, and height is 1.5 m

Expression vs Equation

Expression:

Equation:

Solving Equations

Only one rule:_____

Some broad strategies:

1._____

2._____

3._____

Solve:

$x + 2 = 10$

$y - 7 = 9$

$2x = 12$

$-5x = 25$

$\frac{x}{3} = 5$

$-\frac{y}{7} = 40$

$4x - 3 = -15$

$12 = -3w + 9$

$\frac{3}{4}x - x = 9$

$\frac{x}{2} + \frac{2}{3} = 5$

$3x - 9 + 5x = 15$

$19b - 14 - 21b = -2$

$-11n = 5n - 56$

$11y - 3 = 4y + 11$

$3(x - 4) + 2 = 5 - 2(7 - 2x)$

$1 + 2(x + 5) = -7(2 - x) + 1$

Solving Formulas

We can solve a formula the same way we can solve an equation, we just have to move variables around instead of numbers. The problem will have to tell you what variable to solve for. The same rule and strategies apply.

Solve for the given variable:

$d = rt$, for *t*

$y = mx + b$, for *x*

$P = R - C$, for *C*

$G = T + Jkt$, for *k*

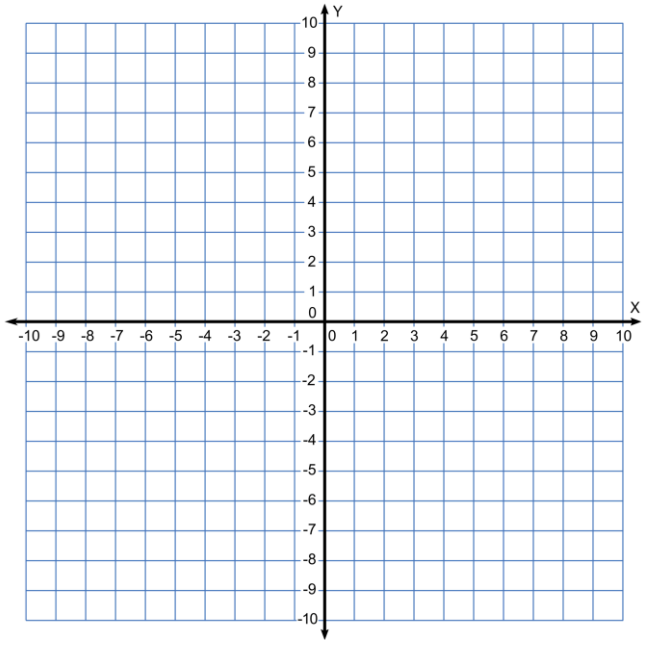
$F = \frac{9}{5}C + 32$, for *C*

$h = -10t^2 + vt + 2$, for *v*

Graphing Linear Equations

First technique:_____

Graph $x + y = 7$

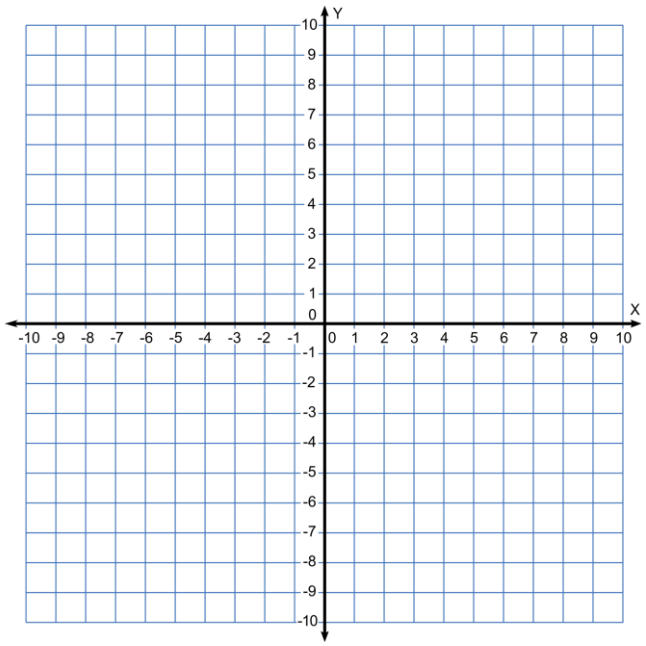


A variation:_____

x-intercept:_____

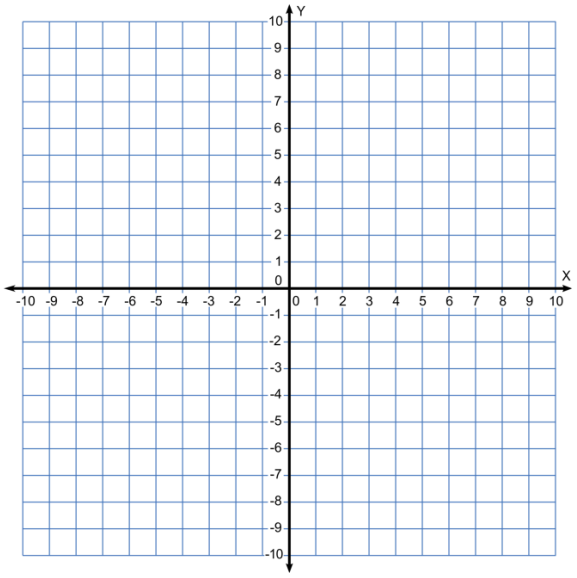
y-intercept:_____

Graph $3x + 4y = 12$



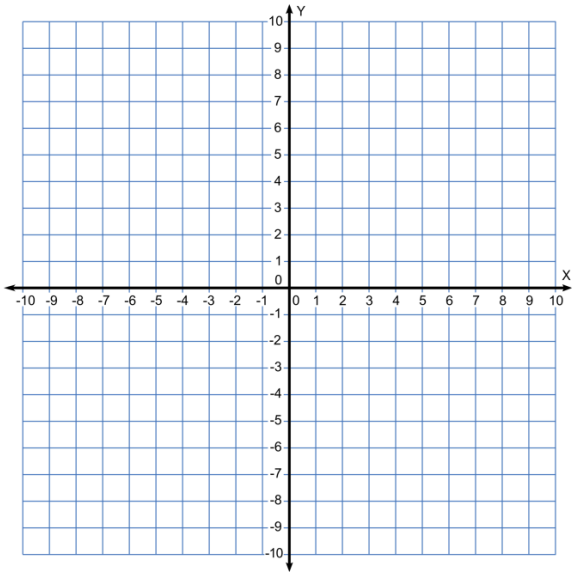
The most famous version:_____

1. _____
2. _____
3. _____



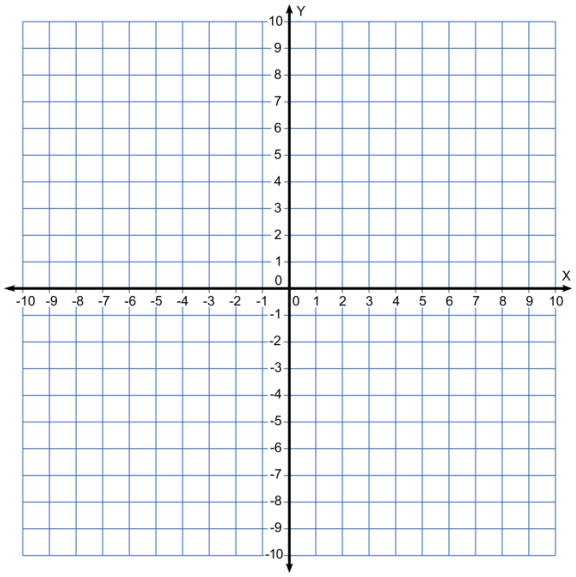
Graph $2x - 3y = 9$

Graph $y = 1 - x$



$x = 2$

$y = -3$



Practice Problems

Evaluate and Simplify

1. $-21+9$

2. $-3-(-4)$

3. $-8\cdot -7$

4. $\frac{-14}{2}$

5. $5\cdot\frac{-15}{-3}$

6. $(-3)^3$

7. $24\div 2\cdot 3$

8. $\frac{-4}{0}$

9. $-8(2-3)\div -4-1$

10. $5-3^2+2^3-(-2)^2$

11. $\frac{5-2(4+7)+1}{4^2-2^2}$

Evaluate the following expressions for $x=-2, y=-3, z=1$

12. $x-2y$

13. $4z+y$

14. x^2-x-10

Solve for x

15. $2x=10$

16. $\frac{x}{3}=-7$

17. $x-3=-8$

18. $2x-3=-17$

19. $3x-5=x+1$

20. $\frac{x}{2}+5=x-3$

Practice Problem Answer Key

Evaluate and Simplify

1. -12
2. 1
3. 56
4. -7
5. 25
6. 9
7. 36
8. $undefined$
9. -3
10. 0
11. -2

Evaluate the following expressions for $x = -2, y = -3, z = 1$

12. 4
13. 1
14. -4

Solve for x

15. $x = 5$
16. $x = -21$
17. $x = -5$
18. $x = -7$
19. $x = 3$
20. $x = 16$