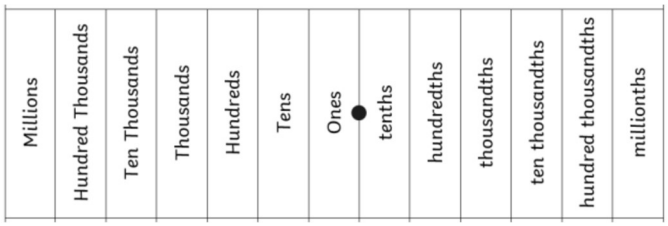
Getting Ready for Algebra Foundations

1. Place Value and Rounding
2. Decimals
3. Fractions
4. Order of Operations
5. Plotting Functions
6. Solving One-Step Equations
7. Circumference and Area of Circles

Place Value and Rounding

Whole numbers are 0, 1, 2, 3, … A digit is any of the numbers 0 – 9. The value of each digit in a number depends on the position, or place, of the digit within the number.



To round a number means to approximate it to a given place. When rounding, look at the digit to the right of the given place. If the digit to the right is less than 5, keep the digit the same. If the digit to the right is 5 or greater, round up.

Ex 1 – Round 88.173 to the nearest hundredth

88.17

Ex 2 – Round 19.7862 to the nearest tenth

19.8

Round the following numbers.

1. 56.75 to the nearest whole number
2. 19.36 to the nearest tenth
3. 912.756 to the nearest hundred
4. 539.52 to the nearest tenth
5. 504.038 to the nearest ten
6. 112.3497 to the nearest thousandth
7. 357.0815 to the nearest hundredth
8. 9172.043 to the nearest thousand

9. 482,615.8 to the nearest ten thousand

10. 10,064.6575 to the nearest thousandth

Decimals

Adding/Subtracting Decimals: Use a vertical format to add or subtract decimals. Begin by lining up the decimal points and use zeros as place holders.

Multiplying Decimals: Multiply decimals as you would whole numbers, then place the decimal point in the product. The number of decimal places is the sum of the number of decimal places in the factors.

Dividing Decimals: To divide decimals, multiply both the divisor and the dividend by the power of 10 that will make the divisor a whole number.

Ex 1 – 0.283 + 0.54

$$\begin{array}{r} 0.283 \\ +\ 0.540 \\ \hline 0.823 \end{array}$$

Ex 2 – Find the product of 4.94 and 0.45

$$\begin{array}{r} 4.94 \\ \times\ 0.45 \\ \hline 2470 \\ 1976 \\ \hline 2.2230 \end{array}$$

Ex 3 – Find the quotient of 7.848 and 0.24

$$0.24\overline{)7.848}$$

Solution: 32.7

Find the sum or difference.

1. 4.1 + 2.3
2. 8.7 – 4.5
3. 84.34 + 67.2
4. 41.39 – 23.17
5. 4.956 – 1.234
6. 8.95 + 3.476

Find the product or quotient.

7. 2.4 x 5.9

8. 15.2 x 0.0004

9. 8.52 x 3.5

10. 3.06 x 4.28

11. 1.2 ÷ 0.3

12. 43.25 ÷ 2.5

13. 160.72 ÷ 32.8

14. 6.7 ÷ 0.05

Fractions

A mixed number is the sum of a whole number and a fraction. An improper fraction is any fraction in which the numerator is greater than the denominator.

To add or subtract fractions, the fractions must have a common denominator.

To multiply fractions, multiply the numerators and multiply the denominators.

To divide fractions, multiply by the reciprocal of the divisor.

Ex 1 – Write $1\frac{9}{10}$ as an improper fraction.

$= \frac{1(10)+9}{10} = \frac{19}{10}$

Ex 2 – Find the sum of $\frac{2}{5}$ and $\frac{3}{4}$

$\frac{2}{5}+\frac{3}{4}$	**Write the original problem**
$\frac{2(4)}{5(4)}+\frac{3(5)}{4(5)}$	**Get a common denominator**
$\frac{8}{20}+\frac{15}{20}$	**Multiply**
$\frac{23}{20}=1\frac{3}{20}$	**Simplify**

1. Write $5\frac{1}{9}$ as an improper fraction

2. Write $8\frac{11}{20}$ as an improper fraction

3. Write $\frac{22}{3}$ as a mixed number

4. Write $\frac{37}{6}$ as a mixed number

Find the sum or difference.

5. $\frac{8}{9}+\frac{4}{9}$

6. $\frac{2}{3}+\frac{4}{5}$

7. $\frac{9}{10}+\frac{5}{7}$

8. $\frac{6}{13}-\frac{2}{7}$

Find the product or quotient.

9. $\frac{2}{9} \times \frac{3}{8}$

10. $4\frac{1}{2} \times \frac{1}{3}$

11. $1\frac{5}{8} \times 2\frac{1}{6}$

12. $\frac{3}{4} \div \frac{7}{2}$

13. $1\frac{2}{3} \div 3\frac{4}{5}$

14. $12 \div \frac{1}{6}$

Order of Operations

Parentheses	**E**xponents	**M**ultiply or **D**ivide	**A**dd or **S**ubtract
( )	$\sqrt{x}$ or x^2	× or ÷	+ or -

Evaluate $(5+3)^2 \div 2 \times 3$.

$= (8)^2 \div 2 \times 3$ **Add within the parentheses**

$= 64 \div 2 \times 3$ **Evaluate the power**

$= 32 \times 3$ **Divide**

$= 96$ **Multiply**

Evaluate the expression.

1. $(-2) - (8)(-4) - (-2)(-6)$

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

3. $12 - 6 \div 2$

4. $15 - (4 + 3^2)$

5. $\frac{20-12}{5^2-1}$

6. $1 + 2 \cdot 9^2$

7. $\frac{45}{8(5-4)-3}$

9. $9 \div 3 \times 2 - 6 + 2$

8. $(-6)^2 \div [(-4) \cdot (5 + 4)]$

10. $\frac{(39-6^2+4)^2-3^2}{(-12-\lceil-8\rceil)^2}$

Plotting Functions

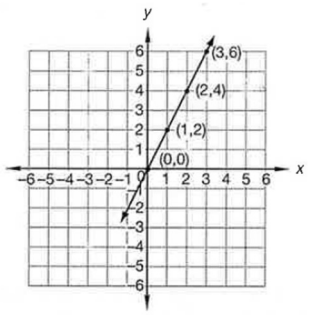
A function is a rule that tells the relationship between numbers. Every function has exactly one output number for every input number.

Steps to graphing:

- Create a table of (x, y) pairs using the rule.
- Plot the pairs on the coordinate grid.
- Draw a line through the points.

Ex 1 – Graph the function $y = 2x$

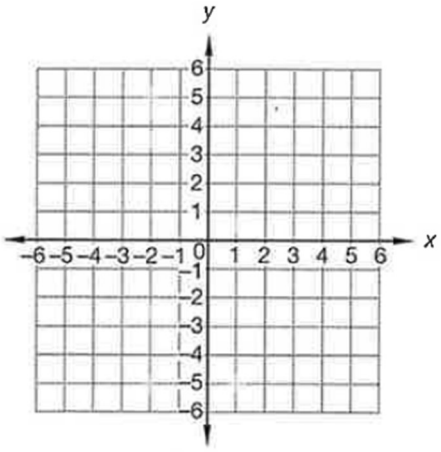
Input x	Output y
0	0
1	2
2	4
3	6



Find the missing numbers in each table using the function rule. Then graph the function.

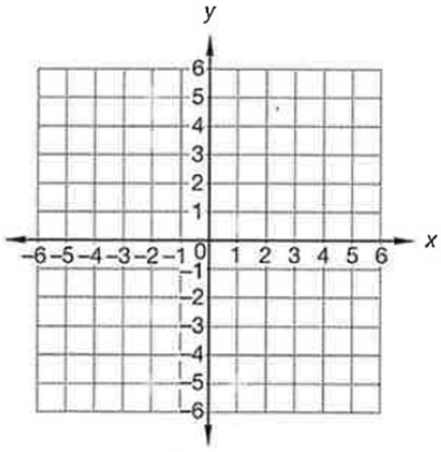
1. $y = 3x - 2$

Input x	Output y
0	
1	
2	
3	



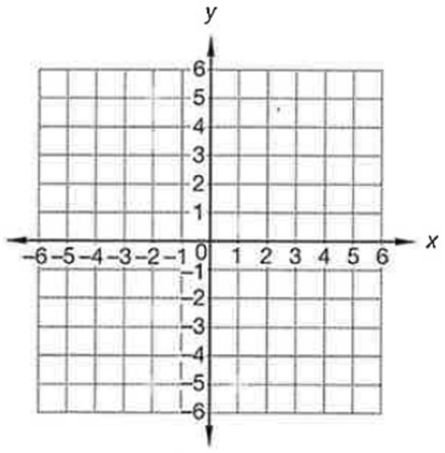
2. $y = 2x + 1$

Input x	Output y
0	
1	
2	
3	



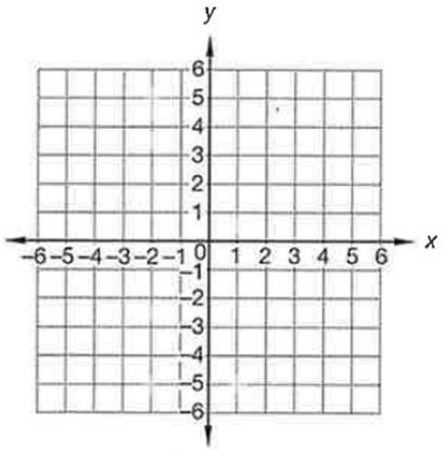
3. $y = x + 4$

Input x	Output y
0	
1	
2	
3	



4. $y = -2x + 3$

Input x		Output y
0		
1		
2		
3		



Solving One-Step Equations

To solve equations, remember whatever operation we perform on one side of an equation, we also perform on the other side of the equation.

Ex 1 – Solve $7 + x = 9.3$

$7 + x = 9.3$	**Write original equation**
$7 - 7 + x = 9.3 - 7$	**Subtract 7 from both sides**
$x = 2.3$	**Simplify both sides**

Ex 2 – Solve $\frac{2}{3}x = 12$

$\frac{2}{3}x = 12$	**Write original equation**
$\frac{3}{2} \cdot \frac{2}{3}x = 12 \cdot \frac{3}{2}$	**Multiply both sides by the reciprocal of $\frac{2}{3}$**
$x = 18$	**Simplify both sides**

Solve each equation.

1. $4\frac{1}{2}x = 27$

2. $10.5 = 7.34 + y$

3. $7\frac{1}{2} - f = 3\frac{1}{4}$

4. $6r = 4.2$

5. $t - 12.6 = 5.4$

6. $9\frac{2}{3}w = 116$

7. $26 = 8 + v$

9. $-7n = 21$

8. $16 = \frac{k}{11}$

10. $18 + m = 8$

Circumference and Area of Circles

The circumference of a circle is the distance around the circle.

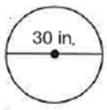
Circumference Formula: $C = \pi d$

Area Formula: $A = \pi r^2$

For π, we use 3.14 or $\frac{22}{7}$.

Ex 1 – Find the circumference of the circle.

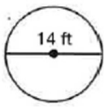
$C = \pi d \approx 3.14(30) \approx 94.2$ in.

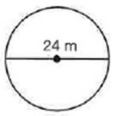


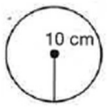
Ex 2 – Find the area of the circle with a radius of 10 cm.

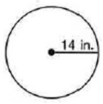
$A = \pi r^2 \approx 3.14(10)^2 \approx 3.14(100) \approx 314$cm^2

Find the circumference of each circle.

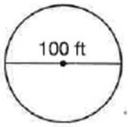
1. 

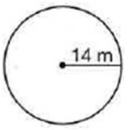
3. 

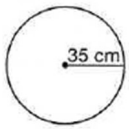
2. 

4. 

Find the area of each circle.

5. 

6. 

7. 

8. A circle with a diameter of 10 in.