

Section 2.1 Variables and Evaluating Expressions

An **expression** is a combination of _____, _____ and _____.

1. Make up some examples of algebraic expressions:

To **evaluate** an expression, we replace the variable(s) with their values and calculate the result.

2. Evaluate each expression for $x = -4$

a. $22x$

b. $-5(x-7)$

c. $\frac{|x-16|}{x}$

d. $\sqrt{-2x+1}-5$

e. x^2

f. $-x^2$

3. Evaluate each expression for $x = 7$ and $y = 5$

a. $4(x-y)$

b. $2xy+3$

c. $\frac{40}{y} - \frac{7}{x}$

d. $\frac{3x+4y-1}{4y}$

Evaluating Geometric Formulas

****Memorize these 8 formulas and their corresponding units****

	Rectangle	Triangle	Circle
Perimeter Units:			
Area Units:			

	Rectangular Solid	Right Cylinder
Volume Units:		

4. Evaluate each geometric formula using the information given. Include units in your answer.
- Find the area of a triangular sail that has a height of 15 feet and a width of 8 feet.

b. Find the circumference and area of a 16-inch diameter pizza, which sells for \$19.00 at Pizzicato.

i. The pizza's circumference, in terms of π , is

ii. The pizza's circumference, rounded to the hundredth's place is:

iii. The pizza's area, in terms of π , is

iv. The pizza's area, rounded to the hundredth's place is:

c. Find the volume of a can that has a diameter of 7 cm and a height of 11 cm.

i. The can's volume, in terms of π , is

ii. The can's volume, rounded to the hundredth's place is:

5. Evaluating other formulas.

To convert a temperature measured in degrees Fahrenheit, F , to degrees Celsius, C , we use the formula $C = \frac{5}{9}(F - 32)$. Convert the room temperature of $68^\circ F$ to Celsius. Write your answer in a complete sentence including units.

Section 2.2 Equations and Inequalities as True/False Statements

An **equation** is a statement that two expressions are equal. An **inequality** compares two expressions with an inequality symbol.

6. Make up some examples of equations and inequalities. What is the difference between an expression and an equation?

Equations and inequalities can be very complex with multiple variables and operations. In Math 60 we will study **linear equations and inequalities**, which have one variable and cannot have any exponents on the variable (other than 1). There cannot be any variables in a square root or denominator.

7. Make up some examples of linear equations and inequalities.

8. Make up some examples of equations and inequalities that are not linear.

Checking Possible Solutions

A solution to an equation or inequality is a value that makes the statement true.

9. Check each equation or inequality to see whether the given number is a solution.

a. Is 5 a solution to $y + 10 = 15$?

b. Is -4 a solution to $3x = 12$?

c. Is -3 a solution to $2x + 7 \leq 15$?

d. Is -2 a solution to $\frac{1}{2}r - 5 < 2(r - 1)$?

More Practice

10. Check each equation or inequality to see whether the given number is a solution.

a. Is 3 a solution to $2(t+5) = 16$?

b. Is -2 a solution to $-3x+5 \geq 1$?

c. Is -3 a solution to $5t+1 \leq -7-t$?

d. Is -6 a solution to $y+5 > 1$?

11. Evaluate each expression for $a = 4$ and $b = -6$

a. $a + 4b^2$

b. $5ab - 8a$

c. $\frac{1}{2}a - \frac{1}{3}b$

d. $\frac{2a - 3b + 10}{ab}$

12. Use a geometric formula and the information given. Write your answer in a complete sentence, including units.

a. A garden bed has a length of 12 feet and a width of 4 feet. How much material would you need to make a border?

b. When a backyard patio was built, the sod was dug out and then filled with sand before bricks were placed on top. The space where sand was filled measured 15 feet by 15 feet by 3 inches. How much sand was needed?

c. A paper cone for drinking water has a base diameter of 2.5 inches and a height of 4 inches. How much water can the cone hold?

Write the answer in terms of π :

Write the answer rounded to the nearest hundredths place:

13. When a plant was purchased, it was 3.2 inches tall and it grows at a rate of 0.2 inches per day. The expression $3.2 + 0.2d$ represents the height of the plant after d days.

a. How tall is the plant after 10 days?

b. The equation $3.2 + 0.2d = 10$ describes the number of days it takes for the plant to be 10 inches tall. Is 22 a solution for this equation?

c. Challenge: Can you figure out how many days it will take the plant to reach 10 inches in height?

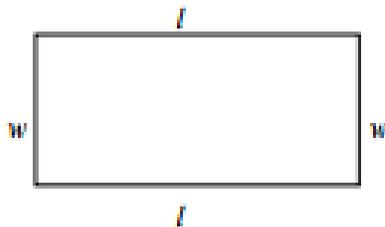
Geometry Reference Sheet

Perimeter The perimeter of a two-dimensional figure is the measure of the distance around that figure. Perimeter is typically measured in ft., mi., cm., m., etc. The perimeter of a circle is the circumference.

Perimeter of a rectangle

$$P = l + w + l + w$$

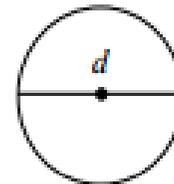
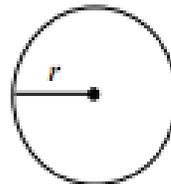
$$P = 2l + 2w$$



Note: diameter = $2 \times$ radius

Circumference of a circle

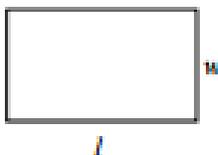
$$C = \pi d \text{ or } C = 2\pi r$$



Area The area of a two-dimensional figure is the measure of the space inside that figure. We typically measure area in square inches, square feet, square miles, square meters, or square kilometers.

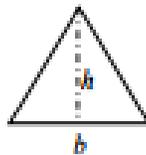
Rectangle

$$A = lw$$



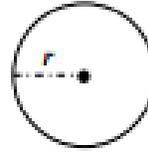
Triangle

$$A = \frac{1}{2}bh$$



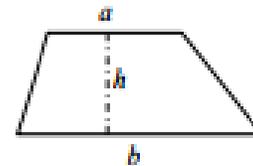
Circle

$$A = \pi r^2$$



Trapezoid

$$A = \frac{1}{2}h(a + b)$$



Measurement abbreviations:

square inches

sq. in.

in²

square feet

sq. ft.

ft²

square miles

sq. mi.

mi²

square meters

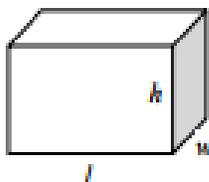
sq. m.

m²

Volume A computer box, a basketball, and a soup can are examples of three-dimensional figures. Volume is the measure of the amount of space inside such an object. Volume is measured using unit cubes, such as cubic inches, cubic feet, cubic meters, etc. Recall that a cube has the same length, width, and height.

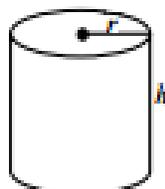
Rectangular Solid

$$V = lwh$$



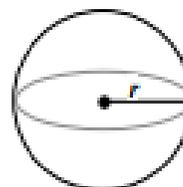
Cylinder

$$V = \pi r^2 h$$



Sphere

$$V = \frac{4}{3}\pi r^3$$



Cone

$$V = \frac{1}{3}\pi r^2 h$$



Measurement abbreviations:

cubic inches

cu. in.

in³

cubic feet

cu. ft.

ft³

cubic centimeters

cu. cm.

cm³

cubic meters

cu. m.

m³