

1.4 Rewrite Formulas and Equations

TEKS a.1, a.2, a.4, 2A.2.A



Before

You solved equations.

Now

You will rewrite and evaluate formulas and equations.

Why?

So you can apply geometric formulas, as in Ex. 36.

Key Vocabulary

- formula
- solve for a variable

A **formula** is an equation that relates two or more quantities, usually represented by variables. Some common formulas are shown below.

Quantity	Formula	Meaning of variables
Distance	$d = rt$	d = distance, r = rate, t = time
Temperature	$F = \frac{9}{5}C + 32$	F = degrees Fahrenheit, C = degrees Celsius
Area of a triangle	$A = \frac{1}{2}bh$	A = area, b = base, h = height
Area of a rectangle	$A = \ell w$	A = area, ℓ = length, w = width
Perimeter of a rectangle	$P = 2\ell + 2w$	P = perimeter, ℓ = length, w = width
Area of a trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$	A = area, b_1 = one base, b_2 = other base, h = height
Area of a circle	$A = \pi r^2$	A = area, r = radius
Circumference of a circle	$C = 2\pi r$	C = circumference, r = radius

READING

The variables b_1 and b_2 are read as “ b sub one” and “ b sub two.” The small lowered numbers are called *subscripts*.

To **solve for a variable** means to rewrite an equation as an equivalent equation in which the variable is on one side and does not appear on the other side.

EXAMPLE 1 Rewrite a formula with two variables

Solve the formula $C = 2\pi r$ for r . Then find the radius of a circle with a circumference of 44 inches.

Solution

STEP 1 Solve the formula for r .

$$C = 2\pi r \quad \text{Write circumference formula.}$$

$$\frac{C}{2\pi} = r \quad \text{Divide each side by } 2\pi.$$

STEP 2 Substitute the given value into the rewritten formula.

$$r = \frac{C}{2\pi} = \frac{44}{2\pi} \approx 7 \quad \text{Substitute 44 for } C \text{ and simplify.}$$

► The radius of the circle is about 7 inches.