Modeling with Linear Equations

Translating Key Words and Phrases

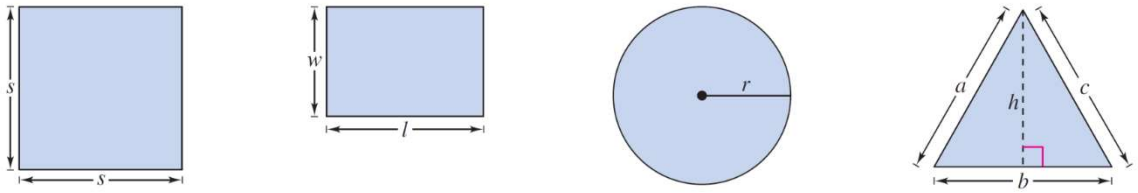
Key Words and Phrases	Verbal Description	Algebraic Expression or Equation
Equality:		
Equals, equal to, is, are, was, will be, represents	• The sale price S is \$10 less than the list price L.	$S = L - 10$
Addition:		
Sum, plus, increased by, more than, total of	• The sum of 5 and x • Seven more than y	$5 + x$ or $x + 5$ $7 + y$ or $y + 7$
Subtraction:		
Difference, minus, less than, decreased by, subtracted from, reduced by	• The difference of 4 and b • Three less than z	$4 - b$ $z - 3$
Multiplication:		
Product, multiplied by, twice, times, percent of	• Two times x • Three percent of t	$2x$ $0.03t$
Division:		
Quotient, divided by, ratio, per	• The ratio of x to 8	$\frac{x}{8}$

EX: You accept a job with an annual income of \$32,300. This includes your salary and a year-end bonus of \$500. You are paid twice a month. What is your gross pay (pay before taxes) for each paycheck?

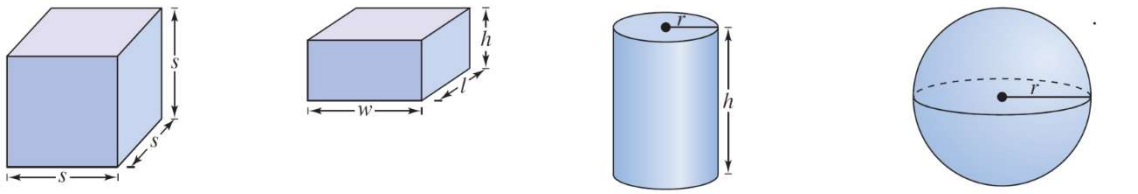
EX: You invested a total of \$10,000 at 4 ½ % and 5 ½ %simple interest. During one year, the two accounts earned \$508.75. How much did you invest in each account? ($I = Prt$)

Common Formulas for Area *A*, Perimeter *P*, Circumference *C*, and Volume *V*

Square	*Rectangle*	*Circle*	*Triangle*
$A = s^2$	$A = lw$	$A = \pi r^2$	$A = \frac{1}{2}bh$
$P = 4s$	$P = 2l + 2w$	$C = 2\pi r$	$P = a + b + c$



Cube	*Rectangular Solid*	*Circular Cylinder*	*Sphere*
$V = s^3$	$V = lwh$	$V = \pi r^2 h$	$V = \frac{4}{3}\pi r^3$



Miscellaneous Common Formulas

Temperature:

$F = \frac{9}{5}C + 32$ F = degrees Fahrenheit, C = degrees Celsius

$C = \frac{5}{9}(F - 32)$

Simple Interest:

$I = Prt$ I = interest, P = principal (original deposit), r = annual interest rate (in decimal form), t = time in years

Compound Interest:

$A = P\left(1 + \frac{r}{n}\right)^{nt}$ n = compoundings (number of times interest is calculated) per year, t = time in years, A = balance, P = principal (original deposit), r = annual interest rate (in decimal form)

Distance:

$d = rt$ d = distance traveled, r = rate, t = time

EX: If a cylindrical can has a volume of 200 cubic centimeters (cm^3) and a diameter of 10 cm, find the height of the can.