

1-3 Solving Equations

Objective: Translate verbal expressions/equations into algebraic expressions/equations and vice versa.
Solve equations using the property of equality.

I. Verbal to algebraic.

- Ex 1) 3 more than a number $a + 3$
- Ex 2) 6 times the cube of a number $6n^3$
- Ex 3) The square of a number decreased by the product of 5 and the number $a^2 - 5a$
- Ex 4) twice the difference of a number and 6 $2(n-6)$

II. Algebraic to verbal.

- Ex 5) $7y - 2 = 19$ The product of 7 and a number decreased by 2 is 19
- Ex 6) $6 = -5 + x$ negative 5 plus a number equals 6

III. Properties of Equality...see page 21...then go to number 8

Reflexive, Symmetric, Transitive, Substitution

IV. Solving Equations

- Ex 7) $53 = 3(y - 2) - 2(3y - 1)$
- Ex 8) $2(2x + 3) - 3(4x - 5) = 22$

$$\begin{array}{l}
 53 = 3y - 6 - 6y + 2 \\
 53 = -3y - 4 \\
 +4 \quad +4 \\
 \hline
 57 = -3y \\
 \frac{-3}{-3} \quad \frac{-3}{-3} \\
 \hline
 y = -19
 \end{array}
 \quad
 \begin{array}{l}
 4x + 6 - 12x + 15 = 22 \\
 -8x + 21 = 22 \\
 -21 \quad -21 \\
 \hline
 -8x = 1 \\
 \frac{-1}{-8} \quad \frac{-1}{-8} \\
 \hline
 x = -\frac{1}{8}
 \end{array}$$

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Ex 9) Solve for l.

$$\begin{array}{l}
 S = \pi l + \pi r^2 \\
 -\pi r^2 \quad -\pi r^2 \\
 \hline
 S - \pi r^2 = \pi l \\
 \frac{S - \pi r^2}{\pi} = \frac{\pi l}{\pi} \\
 \hline
 l = \frac{S - \pi r^2}{\pi}
 \end{array}$$

Ex 11) If $4g + 5 = (4/9)$, what is the value of $4g - 2$?

Way #1

$$\begin{array}{l}
 4g + 5 = \frac{4}{9} \\
 -5 \quad -5 \\
 \hline
 4g = -\frac{41}{9} \\
 \frac{1}{4} \cdot 4g = \frac{1}{4} \cdot -\frac{41}{9} \\
 g = -\frac{41}{36} \\
 4 \left(-\frac{41}{36} \right) - 2 \\
 -\frac{41}{9} - 2 = -\frac{41}{9} - \frac{18}{9} \\
 \hline
 = -\frac{59}{9}
 \end{array}$$

Ex 10) Solve for h.

$$\begin{array}{l}
 A = \frac{1}{2}(b_1 + b_2)h \\
 2(\quad) \left(\frac{1}{2}(b_1 + b_2)h \right) \\
 \hline
 2A = (b_1 + b_2)h \\
 \frac{2A}{(b_1 + b_2)} = \frac{(b_1 + b_2)h}{(b_1 + b_2)} \\
 \hline
 h = \frac{2A}{(b_1 + b_2)}
 \end{array}$$

Way #2

$$\begin{array}{l}
 4g + 5 = \frac{4}{9} - 7.9 \\
 -7 \quad -7 \\
 \hline
 4g - 2 = \frac{4}{9} - \frac{63}{9} \\
 \hline
 = -\frac{59}{9}
 \end{array}$$