MATHEMATICS: EQUATIONS

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Learning Objective: To solve equations with pronumerals and algebraic fractions.

Equations with Algebraic Fractions

To solve an equation that contains one fraction:

- Take all constant terms to one side by performing inverse operations
- Multiply both sides of the equation by the denominator
- Solve the resulting equation

Examples

Solve for x

$$\frac{2x+3}{4} = 2$$

$\times 4$

$$2x + 3 = 8$$

$-3 \quad -3$

$$2x = 5$$

$\div 2 \quad \div 2$

$$\therefore x = \frac{5}{2}$$

Solve for t

$$\frac{3t}{2} - 4 = 2$$

$+4 \quad +4$

$$\frac{3t}{2} = 6$$

$2\times \quad \times 2$

$$3t = 12$$

$\div 3 \quad \div 3$

$$\therefore t = 4$$

Solve for the pronumeral.

$3h + 7 = h - 3$	$8 - 4h = 3h - 5$	$3h - 6 = 3 - 7h$	$8 - 7d = 2 - 9d$

Solve for the pronumeral.

$\frac{5t}{3} - 1 = 4$	$\frac{5t}{3} - 3 = 2$	$\frac{s}{3} - 5 = 5$	$\frac{2b}{5} - 2 = 6$

MATHEMATICS: ANSWER SHEET

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Solving One-step and Two-step Equations

To simplify an expression with grouping symbols:

- Expand the expression in grouping symbols by multiplying the term outside the grouping symbols by each term inside.
- Collect like terms if possible.

To solve a linear equation:

- Isolation the pronumeral by performing the inverse operation to both sides of the equation.

Example:

Simplify

$5(3a - 2) - 2a = (5 \times 3a) + (5 \times -2) - 2a$
$= (15a - 2a) - 10$
$= 13a - 10$

Solve for x

$3x + 10 = 22$
$-10 \quad -10$
$3x = 12$
$\div 3 \quad \div 3$
$\therefore x = 4$

Solve for y

$6 \times \frac{5y}{6} = 10 \times 6$
$5y = 60$
$\div 5 \quad \div 5$
$\therefore y = 12$

Solve for the pronumeral.

$3h + 7 = h - 3$

$3h + 7 = h - 3$
$3h - h = -3 - 7$
$2h = -10$
$h = -10 / 2$
$h = -5$

$8 - 4h = 3h - 5$

$8 - 4h = 3h - 5$
$-4h = 3h - 5 - 8$
$-4h = 3h - 13$
$-4h - 3h = -13$
$-7h = -13$
$h = 13 / 7$

$3h - 6 = 3 - 7h$

$3h - 6 = 3 - 7h$
$3h + 7h - 6 = 3$
$10h - 6 = 3$
$10h = 3 + 6$
$10h = 9$
$h = 9 / 10$
$h = 0.9$

$8 - 7d = 2 - 9d$

$8 - 7d = 2 - 9d$
$8 - 7d + 9d = 2$
$8 + 2d = 2$
$2d = 2 - 8$
$2d = -6$
$d = -6 / 2$
$d = -3$

Solve for the pronumeral.

$\frac{5t}{3} - 1 = 4$

$\frac{5t}{3} - 1 = 4$
$\frac{5t}{3} = 4 + 1$
$\frac{5t}{3} = 5$
$5t = 5 \times 3$
$5t = 15$
$t = 15 / 5$
$t = 3$

$\frac{5t}{3} - 3 = 2$

$\frac{5t}{4} - 3 = 2$
$\frac{5t}{4} = 2 + 3$
$\frac{5t}{4} = 5$
$5t = 5 \times 4$
$5t = 20$
$t = 20 / 5$
$t = 4$

$\frac{s}{3} - 5 = 5$

$\frac{s}{3} - 5 = 5$
$\frac{s}{3} = 5 + 5$
$\frac{s}{3} = 10$
$s = 10 \times 3$
$s = 30$

$\frac{2b}{5} - 2 = 6$

$\frac{2b}{5} - 2 = 6$
$\frac{2b}{5} = 6 + 2$
$\frac{2b}{5} = 8$
$2b = 8 \times 5$
$2b = 40$
$b = 20$