

EMA
Solving Multi-Step Equations

Solve.

1.) $4 + 2(2x + 3) = 3(2x - 1) + 5$

$$4 + 4x + 6 = 6x - 3 + 5$$

$$4x + 10 = 6x + 2$$

$$8 = 2x$$

$$\boxed{4 = x}$$

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2.) $6 - 3(5 + 2n) = 4n + 11 - 7n$

$$6 - 15 - 6n = -3n + 11$$

$$-9 - 6n = -3n + 11$$

$$-20 = 3n$$

$$\boxed{-\frac{20}{3} = n}$$

3.) $-8(-8c - 6) = -6c - 22$

$$64c + 48 = -6c - 22$$

$$70c = -70$$

$$\boxed{c = -1}$$

4.) $5(2c + 6) = -4(-5 - 2c) + 3$

$$10c + 30 = 20 + 8c + 3$$

$$10c + 30 = 23 + 8c$$

$$2c = -7$$

$$\boxed{c = -\frac{7}{2}}$$

5.) $-5(4m - 2) = -2(3 + 6m)$

$$-20m + 10 = -6 - 12m$$

$$16 = 8m$$

$$\boxed{2 = m}$$

6.) $-5(1 - 5y) + (-8y - 2) = -4y - 8y$

$$-5 + 25y - 8y - 2 = -4y - 8y$$

$$17y - 7 = -12y$$

$$-7 = -29y$$

$$\frac{-7}{-29} = y$$

$$\boxed{\frac{7}{29} = y}$$

7.) $\frac{3}{2}t + \frac{1}{3} = \frac{2}{5}t - \frac{11}{15}$

$$\frac{11}{10}t = \frac{-16}{15}$$

$$\boxed{t = \frac{-32}{33}}$$

8.) $6 - \frac{2}{3}(4x - \frac{3}{4}) = 4 - 3(x + \frac{3}{2})$

$$6 - \frac{8x}{3} + \frac{1}{2} = 4 - 3x - \frac{9}{2}$$

$$-\frac{8x}{3} + \frac{11}{2} = -3x - \frac{1}{2}$$

$$\frac{x}{3} = -6$$

$$\boxed{x = -18}$$

Solve each equation for the specified variable.

9.) $A = 2l + 2w$; solve for w .

$$A - 2l = 2w$$

$$\frac{A - 2l}{2} = w$$

$$\boxed{\frac{A}{2} - l = w}$$

10.) $A = \pi r^2$; solve for r .

$$\frac{A}{\pi} = r^2$$

$$\sqrt{\frac{A}{\pi}} = \sqrt{r^2}$$

$$\boxed{\pm \sqrt{\frac{A}{\pi}} = r}$$

11.) $A = \frac{1}{2}(b_1 + b_2)h$; solve for b_1 .

$$2A = (b_1 + b_2)h$$

$$\frac{2A}{h} = b_1 + b_2$$

$$\boxed{\frac{2A}{h} - b_2 = b_1}$$

12.) $V = \frac{4}{3}\pi r^3$; solve for r .

$$3V = 4\pi r^3$$

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

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

$$\boxed{\sqrt[3]{\frac{3V}{4\pi}} = r}$$

13.) $a(x - h)^2 + k = 0$; solve for x .

$$a(x - h)^2 = -k$$

$$(x - h)^2 = \frac{-k}{a}$$

$$\sqrt{(x - h)^2} = \sqrt{\frac{-k}{a}}$$

$$x - h = \pm \sqrt{\frac{-k}{a}}$$

$$\boxed{x = h \pm \sqrt{\frac{-k}{a}}}$$

14.) $F = \frac{9}{5}C + 32$; solve for C .

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

$$5(F - 32) = 9C$$

$$5F - 160 = 9C$$

$$\boxed{\frac{5F - 160}{9} = C}$$

15.) $y = mx + b$; solve for m .

$$y - b = mx$$

$$\boxed{\frac{y - b}{x} = m}$$

16.) $V = \frac{1}{3}\pi r^2 h$; solve for h .

$$3V = \pi r^2 h$$

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