**pp. 50-51, #1-10 all, #25-31 all**

#1-10, solve each literal equation for y.

① $y - 3x = 13$
$\underline{+3x \qquad +3x}$

$\boxed{y = 13 + 3x}$

② $2x + y = 7$
$\underline{-2x \qquad -2x}$

$\boxed{y = 7 - 2x}$

③ $2y - 18x = -26$
$\underline{+18x \qquad +18x}$
$\dfrac{2y}{2} = \dfrac{18x}{2} - \dfrac{26}{2}$

$\boxed{y = 9x - 13}$

④ $20x + 5y = 15$
$\underline{-20x \qquad\qquad -20x}$
$\dfrac{5y}{5} = \dfrac{15}{5} - \dfrac{20x}{5}$

$\boxed{y = 3 - 4x}$

⑤ $9x - y = 45$
$\underline{-9x \qquad -9x}$
$\dfrac{-y}{-1} = \dfrac{45}{-1} - \dfrac{9x}{-1}$

$\boxed{y = -45 + 9x}$

⑥ $6x - 3y = -6$
$\underline{-6x \qquad -6x}$
$\dfrac{-3y}{-3} = \dfrac{-6x}{-3} - \dfrac{6}{-3}$

$\boxed{y = 2x + 2}$

⑦ $4x - 5 = 7 + 4y$
$\quad \underline{-7 \quad -7}$

$\dfrac{4x}{4} - \dfrac{12}{4} = \dfrac{4y}{4}$

$\boxed{y = x - 3}$

⑧ $16x + 9 = 9y - 2x$
$\underline{+2x \qquad\qquad +2x}$
$\dfrac{18x}{9} + \dfrac{9}{9} = \dfrac{9y}{9}$

$\boxed{y = 2x + 1}$

⑨ $2 + \frac{1}{6}y = 3x + 4$
$\underline{-2 \qquad\qquad\quad -2}$

$\frac{1}{6} y^{\cdot 6} = 3x^{\cdot 6} + 2^{\cdot 6}$

$\boxed{y = 18x + 12}$

⑩ $11 - \frac{1}{2}y = 3 + 6x$
$\underline{-11 \qquad\quad -11}$

$-\frac{1}{2}y^{\cdot(-2)} = -8^{\cdot(-2)} + 6x^{\cdot(-2)}$

$\boxed{y = 16 - 12x}$

#25-28. Solve for the indicated variable.

(25) Profit: $P = R - C$; for C.

$$\begin{array}{ll} & -R \quad -R \end{array}$$

$$\frac{P-R}{-1} = \frac{-C}{-1}$$

$$\boxed{C = R - P}$$

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(26) Surface area of a cylinder: $S = 2\pi r^2 + 2\pi rh$, for h

$$-2\pi r^2 \quad -2\pi r^2$$

$$\frac{S}{2\pi r} - \frac{2\pi r^2}{2\pi r} = \frac{2\pi rh}{2\pi r}$$

$$\boxed{h = \frac{S}{2\pi r} - r} \quad \text{OR} \quad \boxed{h = \frac{S - 2\pi r^2}{2\pi r}}$$

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(27) Area of trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$; for $b_2$

$$A \cdot 2 = \frac{1}{2}hb_1 \cdot 2 + \frac{1}{2}hb_2 \cdot 2$$

$$2A = hb_1 + hb_2$$

$$-hb_1 \quad -hb_1$$

$$\frac{2A}{h} - \frac{hb_1}{h} = \frac{hb_2}{h}$$

$$\boxed{b_2 = \frac{2A}{h} - b_1} \quad \text{OR} \quad \boxed{b_2 = \frac{2A - hb_1}{h}}$$

(28) Average acceleration of an object: $a \overset{\cdot t}{=} \dfrac{V_1 - V_0}{t} \overset{\cdot t}{;}$ for $V_1$.

$$at = V_1 - V_0$$
$$+V_0 \qquad\qquad +V_0$$

$$\boxed{V_1 = at + V_0}$$

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(29) A common statistic used in professional football is the quarter back rating. This rating is made up of four major factors. One factor is the completion rating given by the formula $R = 5\left(\dfrac{C}{A} - 0.3\right)$, where C is the number of completed passes and A is the number of attempted passes. Solve the formula for C.

$$R = 5\left(\frac{C}{A} - 0.3\right) \qquad \text{OR} \qquad R = 5\left(\frac{C}{A} - 0.3\right)$$

$$R \overset{\cdot A}{=} \frac{5C}{A} \overset{\cdot A}{-} 1.5 \overset{\cdot A}{} \qquad\qquad R \overset{\cdot 2A}{=} \frac{5C}{A} \overset{\cdot 2A}{-} 1.5 \overset{\cdot 2A}{}$$

$$RA = 5C - 1.5A \qquad\qquad 2RA = 10C - 3A$$
$$+1.5A \qquad\quad +1.5A \qquad\qquad +3A \qquad\quad +3A$$

$$\frac{RA + 1.5A}{5} = \frac{5C}{5} \qquad\qquad \frac{2RA + 3A}{10} = \frac{10C}{10}$$

$$\boxed{C = \frac{RA + 1.5A}{5}} \qquad\qquad \boxed{C = \frac{2RA + 3A}{10}}$$

(30) Newton's law of gravitation is given by the formula $F = G\left(\dfrac{m_1 m_2}{d^2}\right)$, where $F$ is the force between two objects of masses $m_1$ and $m_2$, $G$ is the gravitational constant, and $d$ is the distance between the two objects. Solve the equation for $m_1$.

$$F = G\left(\frac{m_1 m_2}{d^2}\right)$$

$$F \cdot d^2 = \frac{G m_1 m_2 \cdot d^2}{d^2}$$

$$\frac{F d^2}{G m_2} = \frac{G m_1 m_2}{G m_2}$$

$$\boxed{m_1 = \frac{F d^2}{G m_2}}$$

(31) The sale price $S$ (in dollars) of an item is given by the formula $S = L - rL$, where $L$ is the list price (in dollars) and $r$ is the percent of discount in decimal form.

a.) Solve the formula for $r$:

$$S = L - rL$$
$$\phantom{S = }-L \quad -L$$
$$\frac{S}{-L} - \frac{L}{-L} = \frac{-rL}{-L}$$

$$\boxed{r = 1 - \frac{S}{L}}$$

b.) The list price of the shirt is $21.50. What is the percent of discount?

$L = 21.50 \qquad S = 17.20 \qquad r = ?$

$$r = 1 - \frac{S}{L}$$

$$r = 1 - \frac{17.20}{21.50}$$

$$r = 0.2 \quad \text{OR} \quad \boxed{20\%}$$



Sale price:
$17.20