Literal Equations and Formulas

Solve each equation for y. Then find the value of each value of x.

1) $10x + 5y = 80$; $x = 3, 5$

$-10x \quad -10x$

$\frac{5y}{5} = \frac{80-10x}{5}$

$y = 16 - 2x$

$y = 16-2x$ $\quad$ $y = 16-2x$

$y = 16-2(3)$ $\quad$ $y = 16-2(5)$

$y = 16-6$ $\quad$ $y = 16-10$

$y = 10$ $\quad$ $y = 6$

What equation do you get when you solve $ax - bx = c$ for x?

2) $ax - bx = c$

$\frac{x(a-b)}{a-b} = \frac{c}{a-b}$

$x = \frac{c}{a-b}$

Rewrite each formula.

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

$3 \cdot V = 3 \cdot \frac{1}{3}\pi r^2 h$

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

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

4) $2(x+a) = 46$ for a

$2x + 2a = 46$

$-2x \quad -2x$

$\frac{2a}{2} = \frac{46-2x}{2}$

$a = 23 - x$

Ratios, Rates, and Conversions

① Which store offers the best deal?

Store A: $\frac{\$25}{2 \text{ shirts}} \div 2 = \frac{\$12.50}{1 \text{ shirt}}$

Store B: $\frac{\$45}{4 \text{ shirts}} \div 4 = \frac{\$11.25}{1 \text{ shirt}}$

Store C: $\frac{\$30}{3 \text{ shirts}} \div 3 = \frac{\$10}{1 \text{ shirt}}$ ← Best Deal

Unit Rate

② Convert 3.2ft to cm.

$$\frac{3.2\text{ft}}{1} \cdot \frac{12\text{in}}{1\text{ft}} \cdot \frac{2.54\text{cm}}{1\text{in}} = 97.5\text{ cm (Round – Tenths)}$$

③ Convert 75mph to m/s.

$$\frac{75\text{mi}}{1\text{hr}} \cdot \frac{1\text{hr}}{60\text{min}} \cdot \frac{1\text{min}}{60\text{sec}} \cdot \frac{1.609\text{km}}{1\text{mi}} \cdot \frac{1{,}000\text{m}}{1\text{km}} = 33.5\ \frac{\text{m}}{\text{s}}$$

Rounded (Tenths)

Solving Proportions

Solve each equation.

1) $\frac{7}{8} \times \frac{m}{12}$

$8 \cdot m = 7 \cdot 12$

$\frac{8m}{8} = \frac{84}{8}$

$m = 10.5$

2) $\frac{b-8}{5} \times \frac{b+3}{4}$

$4(b-8) = 5(b+3)$

$4b - 32 = 5b + 15$

$-4b \quad -4b$

$-32 = b + 15$

$-15 \quad -15$

$-47 = b$

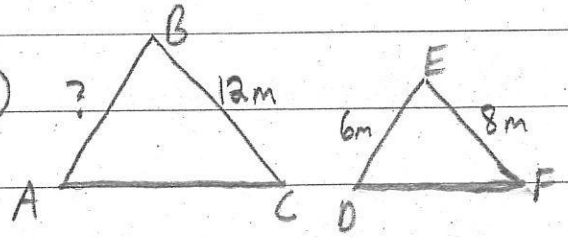
3) 8oz of orange juice contains 97mg of vitamin C. How many mg of vitamin C in 12oz?

$\frac{8\text{oz}}{97\text{mg}} \times \frac{12\text{oz}}{x\text{ mg}}$

$\frac{8x}{8} = \frac{1,164}{8}$

$x = 145.5\text{mg}$

Proportions and Similar Figures

① 

$\triangle ABC \sim \triangle DEF$

$$\frac{AB}{DE} = \frac{BC}{EF}$$

$$\frac{AB}{6} \times \frac{12}{8}$$

$$\frac{8(AB)}{8} = \frac{72}{8}$$

$AB = 9\,m$

② The distance from Jacksonville to Gainesville on a map is about 0.6in. What is the actual distance?

Scale
1in : 110mi

$$\text{Map scale} = \frac{\text{map distance}}{\text{actual distance}}$$

$$\frac{1\,in}{110\,mi} \times \frac{.6\,in}{X}$$

$X = 66$ miles

Percents

① What percent of 90 is 54?

$\frac{a}{b} = \frac{p}{100}$

$\frac{54}{90} = \frac{p}{100}$

$\frac{90p}{90} = \frac{5,400}{90}$

$p = 60\%$

$p \cdot 90 = 54$

$\frac{90p}{90} = \frac{54}{90}$

$p = 0.6$

$p = 60\%$

② What is 35% of 120?

$\frac{a}{b} = \frac{p}{100}$

$\frac{a}{120} = \frac{35}{100}$

$\frac{100a}{100} = \frac{4,200}{100}$

$a = 42$

$n = (.35)(120)$

$n = 42$

③ 85% of what number is 127.5?

$\frac{a}{b} = \frac{p}{100}$

$\frac{127.5}{b} = \frac{85}{100}$

$\frac{85b}{85} = \frac{12,750}{85}$

$b = 150$

$.85 \times n = 127.5$

$\frac{.85n}{.85} = \frac{127.5}{.85}$

$n = 150$

④ You deposit: $1,200
Interest Rate: 4.2%
Time: 5 years
How much interest?

$I = PRT$

$I = (1,200)(.042)(5)$

$I = \$252$

Percent of Change

$$\text{Percent of Change} = \frac{\text{Amount of Change}}{\text{Original Amount}}$$

Students at SK Last Year : 625
Students at SK This Year : 652

Find the percent of change.

Ex) $\%\text{ of Inc} = \frac{\text{Amt. of Ch.}}{\text{Orig. Amt.}}$

$$= \frac{652-625}{625}$$

$$= \frac{27}{625}$$

$$= .0432 = \boxed{4.32\% \text{ Increase}}$$

Inequalities and Their Graphs

Determine whether each number is a solution of the inequality

1) $3x + 1 \geq 10$

a) 5

$3(5)+1 \geq 10$

$15+1 \geq 10$

$16 \geq 10$ ✓

b) 3

$3(3)+1 \geq 10$

$9+1 \geq 10$

$10 \geq 10$ ✓

c) 0

$3(0)+1 \geq 10$

$0+1 \geq 10$

$1 \not\geq 10$ X

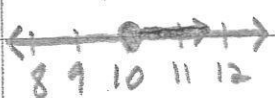
Therefore 5 and 3 are solutions and 0 is not a solution.

Graph each inequality.

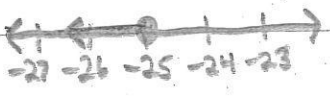
2) $x > -2$

3) $-8 \geq m$

4) $y \geq 10$



5) $n \leq -25$



Solving Inequalities Using Addition or Subtraction

Solve and graph each inequality.

1) $f - 5 < -12$

$+5 \quad +5$

$f < -7$

2) $-3 \leq C + 5$

$-5 \quad -5$

$-8 \leq C$

3) Your cell phone has 16 GB of storage capacity. You have used 12.5 GB. Write and solve an inequality to find the possible amount storage that can be used.

C = storage capacity that can be used

$C + 12.5 \leq 16$

$-12.5 \quad -12.5$

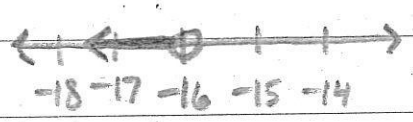
$C \leq 3.5$ GB

Solving Inequalities Using Multiplication or Division

Solve and graph each inequality

① $\frac{y}{8} < -2 \cdot 8$

$y < -16$



② $\frac{24}{6} \leq \frac{6m}{6}$

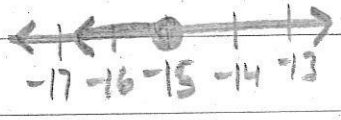
$4 \leq m$

③ $\frac{-18}{-2} < \frac{-2c}{-2}$

$9 > c$

④ $\frac{n}{-3} \geq 5(-3)$

$n \leq -15$



Solving Multi-Step Inequalities

Solve each inequality:

① $-3(y+1)+4y \geq 4(y-6)$

$-3y-3+4y \geq 4y-24$

$y-3 \geq 4y-24$

$-4y \quad\quad -4y$

$-3y-3 \geq -24$

$+3 \quad\quad +3$

$-3y \geq -21$

$\frac{-3y}{-3} \geq \frac{-21}{-3}$

$y \leq 7$

② $10-8a \geq 2(5-4a)$

$10-8a \geq 10-8a$

$+8a \quad\quad +8a$

$10 \geq 10$

All Real Numbers

③ $6m-5 > 7m+7-m$

$6m-5 > 6m+7$

$-6m \quad\quad -6m$

$-5 \not> 7$

No Solution