Name: _____ Date: _____

Notes: Solving Equations

Do Now: Solve for x in each of the equations.

1) $2.25(6x-12) = -18 + 19.5x + 20$

$13.5x - 27 = -18 + 19.5x + 20$

$13.5x - 27 = 19.5x + 2$

$-29 = 6x$

$x = \frac{-29}{6}$

2) $y = mx + b$

$-b \quad -b$

$\frac{y-b}{m} = \frac{mx}{m}$

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

Which value of x satisfies the equation $\frac{5}{6}\left(x + \frac{9}{20}\right) = 36$?

$\frac{5}{6}(x) + \frac{5}{6}\left(\frac{9}{20}\right) = 36$

$\frac{5}{6}x + \frac{3}{8} = 36$

$-\frac{3}{8} \quad -\frac{3}{8}$

$\left(\frac{6}{5}\right)\frac{5}{6}x = 35.625\left(\frac{6}{5}\right)$

$x = 42.75$

Putting Fractions in the Calculator:

Look for "$\frac{\square}{\square}$" button.

TI-84: ALPHA → Y= → 1: n/d → Enter

How about....

$2x - 15 = 2x + 15$ vs $2x - 15 = 2x - 15$

$-2x \quad -2x$ $\qquad$ $-2x \quad -2x$

$-15 \neq 15$ $\qquad$ $-15 = -15$

$\therefore \varnothing$ $\qquad$ $\therefore$ ∞ solutions

get x alone

Solve the equation below for x in terms of k.

$$8(kx-9)-3kx=28-13k$$

$8kx-72-3kx=28-13k$

$5kx-72=28-13k$

$+72 \quad +72$

$\frac{5kx}{5k}=\frac{100-13k}{5k}$

$$x=\frac{100-13k}{5k}$$

The equation for the volume of a cylinder is $V=\pi r^2 h$. The positive value of r, in terms of h and V, is

get r alone

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

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

$$\sqrt{\frac{V}{\pi h}}=r$$

Solve for x in the equation,

$$xy+8xz=20$$

Factor out an "x" on the left side of the equation!

$\frac{x(y+8z)}{(y+8z)}=\frac{20}{(y+8z)}$

$$x=\frac{20}{y+8z}$$

Name: _____ Date: _____

Classwork: Solving Equations

Solve each of the equations for the variable stated. If no variable stated, solve for x.

1) *Solve for H:* $B = H + xH$

$\frac{B}{1+x} = \frac{H(1+x)}{1+x}$

$\frac{B}{1+x} = H$

2) $5(0.5x - 1.2) = \frac{5}{2}(x - 2.4)$

$2.5x - 6 = 2.5x - 6$

Same

$\therefore$ ∞ solutions

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

$\left(\frac{3}{1}\right) V = \frac{1}{3}\pi r^2 h \left(\frac{3}{1}\right)$

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

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

4) $4[0.3b + (-5)] + 12 = 0.8\left(2b - \frac{1}{2}\right)$

$1.2b - 20 + 12 = 1.6b - 0.4$

$1.2b - 8 = 1.6b - 0.4$

$-1.2b \quad +0.4 \quad -1.2b \quad +0.4$

$-7.6 = 0.4b$

$-19 = b$

5)

The distance a free falling object has traveled can be modeled by the equation $d = \frac{1}{2}at^2$, where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d?

(1) $t = \sqrt{\frac{da}{2}}$

(2) $t = \sqrt{\frac{2d}{a}}$

(3) $t = \left(\frac{da}{d}\right)^2$

(4) $t = \left(\frac{2d}{a}\right)^2$

- get t alone

$\left(\frac{2}{1}\right) d = \frac{1}{2} a t^2 \left(\frac{2}{1}\right)$

$\frac{2d}{a} = \frac{at^2}{a}$

$\sqrt{\frac{2d}{a}} = \sqrt{t^2}$

$\sqrt{\frac{2d}{a}} = t$

6)

An equation is given below.

$$4(x - 7) = 0.3(x + 2) + 2.11$$

The solution to the equation is

(1) 8.3 (3) 3

(2) 8.7 (4) −3

$4x-28=0.3x+0.6+2.11$

$4x-28=0.3x+2.71$

$-0.3x \quad +28 \quad -0.3x \quad +28$

$\frac{3.7x}{3.7}=\frac{30.71}{3.7}$

$x=8.3$

7)

The formula for blood flow rate is given by $F = \frac{p_1 - p_2}{r}$, where F is the flow rate, p_1 the initial pressure, p_2 the final pressure, and r the resistance created by blood vessel size. Which formula can *not* be derived from the given formula?

(1) $p_1 = Fr + p_2$ (3) $r = F(p_2 - p_1)$

(2) $p_2 = p_1 - Fr$ (4) $r = \frac{p_1 - p_2}{F}$

$(r)F=\frac{P_1-P_2}{r}(r)$

$\frac{Fr}{F}=\frac{P_1-P_2}{F}$

$r=\frac{P_1-P_2}{F}$

8) The formula for the area of a triangle is $A = \frac{1}{2}bh$. Express b in terms of A and h.

$(\frac{2}{1})A=\frac{1}{2}bh(\frac{2}{1})$

$2A=bh$

$\frac{2A}{h}=\frac{bh}{h}$

$b=\frac{2A}{h}$

The area of a triangle is 45 square feet and its height is 3 ft. Find the base of the triangle.

A h

$b=\frac{2(45)}{3}$

$b=\frac{90}{3}$

$b=30$ ft