

- 1) Eddy can buy Q-bolts for \$2.30 each with S&H of \$10.95 or he can buy Q-bolts for \$1.95 each with S&H of \$15.00. For what value of x are the choices approximately equal?
- 2) The formula for a conic frustum is $V = \frac{1}{3} \pi H (R^2 + Rr + r^2)$. Solve this equation for H .
- 3) The formula for determining the size when two ducts (a & b) are combined is $F = \frac{a b}{a + b}$. Solve this equation for ' a '. Problem (3a) $2 \frac{1}{4}$ A, $4 \frac{3}{8}$ B: Compute F as a fraction.
- 4) Consider: $\frac{4x - 7}{2} = 10 - 4 \frac{4 - 9x}{3}$
- (a) Use to check if $X = -0.817$ is an exact solution
 - (b) Solve by graphing
 - (c) Solve by algebra
- 5) 10 gal of a special sealer is needed that is 35% hardener and 65% resin. Brand A is 25% hardener & 75% resin while Brand B is 50% hardener & 50% resin. How much of each (Brand A/Brand B) must be used to make the special sealer. Let A = gal of A, B = gal of B. Write a 2×2 system of equations which models this scenario and then solve the problem by both addition and substitution methods.

6) A city map has a well located at its center (0, 0). The map coordinates frame $[-25, 25] \times [-20, 20]$. Main St follows the x-axis and Union Ave follows the y-axis. (a) Pipeline A passes through the well and (7, 5). Give the linear equation for pipeline A. (b) Pipeline (B) passes through (8, -15) & (-8, -18). Give the linear equation for pipeline B. (c) Use your TI to find where those pipelines intersect (this is off the map). (d) Use your TI to find where pipeline B intersects Main St (this is off the map).

7) Beth decides to make aprons and sell them at the Fair. She buys a permit for \$50 and spends \$150 on her booth. It also costs her \$3.70 to make each apron. She plans to sell them for \$15 each. Let $x =$ aprons, $y =$ \$.

- (a) Write a linear equation for Beth's expenses (what she spends)
- (b) Write a linear equation for Beth's revenues (what she receives from sales).
- (c) Write a linear equation for Beth's profits (revenues - expenses).
- (d) Determine how many aprons Beth must sell to breakeven.
- (e) Determine how much she will earn if she sells 40 aprons.
- (f) How many aprons must she sell to earn \$1,500?

8) A sensor has the following readings. Assuming a linear relationship, use the first two readings to find $y = mx + b$. Then determine the missing readings.

(x) CO ₂	(y) volts
3×10^{-2}	7.4
10^{-3}	-3.3
0	
	0
2.6	
	-0.05

9) John needs to replace his 400' of barbed wire fence with either wood fence or rabbit fence. Ideally, he would like to use wood the whole way but it costs \$3.20/ft while the rabbit fence is only \$1.87/ft. He has a limited budget of \$1,000. Let $x =$ wood portion. Write an equation for the cost of the entire new fence. Then determine how much of each type is possible.

10) Write the result as a fraction (both improper and proper:

rounded to the hundredths place:

c) $\frac{3^{6\pi-5}}{2000\pi} \approx$

a) $2 \frac{5}{8} \times 3 \frac{1}{8} =$

d) $\sqrt{(4\pi - 5)10^2 - 2} \approx$

b) $\frac{2 \frac{5}{8} - 1 \frac{7}{8}}{2 \frac{5}{8}} =$

e) $\frac{5.8 \times 10^6}{7.2 \times 10^4} \approx$

Rewrite this expression without parentheses:

$$\sqrt{\left(\frac{2\pi - X}{3\pi}\right) * 3} / \sqrt{2} / \pi / X$$

$$4E^{-5} / (2X - 1) * 10^{\sqrt{(7X - 5) / 2X + 1}}$$

- 1) Eddy can buy Q-bolts for \$2.30 each with S&H of \$10.95 or he can buy Q-bolts for \$1.95 each with S&H of \$15.00. For what value of x are the choices approximately equal?

$$2.30x + 10.95 = 1.95x + 15.00$$

$$x \approx 11.57 \rightarrow 12 \text{ bolts}$$

- 2) The formula for a conic frustum is $V = \frac{1}{3} \pi H (R^2 + Rr + r^2)$. Solve this equation for H.

$$H = \frac{3V}{\pi(R^2 + Rr + r^2)}$$

- 3) The formula for determining the size when two ducts (a & b) are combined is $F = \frac{ab}{a+b}$. Solve this equation for 'a'. Problem (3a) $2\frac{1}{4}$ $\boxed{\text{STO}}$ A, $4\frac{3}{8}$ $\boxed{\text{STO}}$ B: Compute F as a fraction.

$$a = \frac{Fb}{b - F}$$

$$F = 315/212$$

- 4) Consider: $\frac{4x - 7}{2} = 10 - 4\frac{4 - 9x}{3}$

(a) Use $\boxed{\text{STO}}$ to check if $X = -0.817$ is an exact solution

(b) Solve by graphing

(c) Solve by algebra

(a) Close but not an exact sol'n

(b) $x = -0.816667$

(c) $x = 49/60$

- 5) 10 gal of a special sealer is needed that is 35% hardener and 65% resin. Brand A is 25% hardener & 75% resin while Brand B is 50% hardener & 50% resin. How much of each (Brand A/Brand B) must be used to make the special sealer. Let A = gal of A, B = gal of B. Write a 2×2 system of equations which models this scenario and then solve the problem by both addition and substitution methods.

$$A + B = 10, 0.25A + 0.50B = 0.35(10), 0.75A + 0.50B = 0.65(10)$$

$$A = 6 \text{ gal}, B = 4 \text{ gal}$$

- 6) A city map has a well located at its center (0, 0). The map coordinates frame $[-25, 25] \times [-20, 20]$. Main St follows the x-axis and Union Ave follows the y-axis. (a) Pipeline A passes through the well and (7, 5). Give the linear equation for pipeline A. (b) Pipeline (B) passes through (8, -15) & (-8, -18). Give the linear equation for pipeline B. (c) Use your TI to find where those pipelines intersect (this is off the map). (d) Use your TI to find where pipeline B intersects Main St (this is off the map).

(a) $y = (5/7)x$ (b) $y = (3/16)x - 33/2$ (c) $\approx (-31.3, -22.4)$ (d) (88, 0)

- 7) Beth decides to make aprons and sell them at the Fair. She buys a permit for \$50 and spends \$150 on her booth. It also costs her \$3.70 to make each apron. She plans to sell them for \$15 each. Let $x =$ aprons, $y =$ \$.

- (a) Write a linear equation for Beth's expenses (what she spends). $E = 3.7x + 200$
 (b) Write a linear equation for Beth's revenues (what she receives from sales). $R = 15x$
 (c) Write a linear equation for Beth's profits (revenues - expenses). $P = 11.3x - 200$
 (d) Determine how many aprons Beth must sell to breakeven. $x \approx 17.7 \rightarrow 18$ aprons
 (e) Determine how much she will earn if she sells 40 aprons. $P = \$252$
 (f) How many aprons must she sell to earn \$1,500? $x \approx 150.4 \rightarrow 151$ aprons

- 8) A sensor has the following readings. Assuming a linear relationship, use the first two readings to find $y = mx + b$. Then determine the missing readings.

(x) CO ₂	(y) volts
3×10^{-2}	7.4
10^{-3}	-3.3
0	~ -3.67
~ 0.0099	0
2.6	~ 955.6
~ 0.0098	-0.05

$y = (10700/29)x - 532/145 \approx 369.0x - 3.67$

- 9) John needs to replace his 400' of barbed wire fence with either wood fence or rabbit fence. Ideally, he would like to use wood the whole way but it costs \$3.20/ft while the rabbit fence is only \$1.87/ft. He has a limited budget of \$1,000. Let $x =$ wood portion. Write an equation for the cost of the entire new fence. Then determine how much of each type is possible.

$3.20x + (1.87)(400 - x) = 1,000 \quad x \approx 189.5$ ft

- 10) Write the result as a fraction (both improper and proper:
 rounded to the hundredths place: a) $2 \frac{5}{8} \times 3 \frac{1}{8} = 525/64 = 22 \frac{13}{64}$ b) $\frac{2 \frac{5}{8} - 1 \frac{7}{8}}{2 \frac{5}{8}} = 2/7$
 c) $\frac{3^{6\pi-5}}{2000\pi} \approx 645.26$ d) $\sqrt{(4\pi - 5)10^2 - 2} \approx 27.47$ e) $\frac{5.8 \times 10^6}{7.2 \times 10^4} \approx 80.56$

Rewrite this expression without parentheses:

$$\sqrt{\frac{(2\pi - x)(3\pi)}{2}} \cdot \frac{3}{\pi x \sqrt{2}}$$

$$\frac{4 \times 10^{-5} (2x - 1) \cdot 10^4}{(7x - 5)(2x + 1)}$$

$$\frac{2\pi - x}{3\pi} \cdot \frac{3}{\pi x \sqrt{2}}$$

$$\frac{4 \times 10^{-5}}{2x - 1} \cdot \frac{10^{7x-5}}{2} \cdot x + 1$$