

Grade 9 Pre-AP Mathematics
Unit 2 – Solving Equations – Part B

Mr. Nolfi

Victim:

Mr. Solutions

Get another brilliant display of mathematical reasoning!

APP	TIPS	COM
23/23	16/16	10/10

1. Snoop the Super Cake Boss loves creating Super-Sized Dora the Explorer birthday cakes. Each Dora cake has a length that is 1.75 **times** greater than the width. In addition, the perimeter of each Dora cake is 550 cm. Find the **dimensions** (i.e. length and width) of the cake. **(6 APP)**

Let w represent the width of the cake. Then $1.75w$ represents the length.

$\therefore$ perimeter is 550 cm,

$$2(w + 1.75w) = 550$$

$$\therefore 1.75w = 175$$

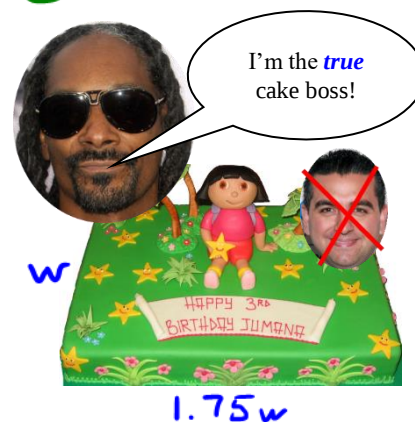
$$\therefore w + 1.75w = \frac{550}{2}$$

$$\therefore 2.75w = 275$$

$$\therefore \frac{2.75w}{2.75} = \frac{275}{2.75}$$

$$\therefore w = 100$$

The width of the cake is 100 cm and the length is 175 cm.



2. Jashveer earns \$2.00 per hour **more than** Subhan but \$2.50 per hour **less than** Gurtej. Altogether, the three students earn \$69.50 per hour. How much do each of them earn? **(8 APP)**

Subhan's Hourly Wage: $j - 2$

Jashveer's Hourly Wage: j

Gurtej's Hourly Wage: $j + 2.5$

sum of wages is 69.50

$$j - 2 + j + j + 2.5 = 69.5$$

$$\therefore 3j + 0.5 = 69.5$$

$$\therefore 3j = 69.5 - 0.5$$

$$\therefore 3j = 69$$

$$\therefore \frac{3j}{3} = \frac{69}{3}$$

$$\therefore j = 23$$

$$\therefore j - 2 = 21, j + 2.5 = 25.5$$

Subhan earns \$21 per hour,

Jashveer earns \$23 per hour

and Gurtej earns \$25.50 per hour.

3. Usman Appliances pays salespeople \$10.75 per hour worked **plus** 3% of total sales. **(9 APP)**

(a) Complete the following table by writing an **algebraic expression** for the **amount earned** in each case.

Quantity	Variable	Algebraic Expression for Amount Earned in \$
Number of Hours Worked	t	$10.75t$ for working t hours
Appliance Sales (\$)	s	$0.03s$ for having sales of s \$
Total Earnings (\$)	E	$10.75t + 0.03s$ in total

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- (b) How much would salesperson Sarah earn for working for 20 hours and having sales of \$20,000.00?

$$t = 20, s = 20000, E = ?$$

$$E = 10.75(20) + 0.03(20000) = 815$$

Sarah would earn \$815 for working 20 hours and having sales of \$20,000.

- (c) How much does salesperson Jensen need to sell to earn \$1500.00 for 25 hours of work?

$$t = 25, s = ?, E = 1500$$

$$1500 = 10.75(25) + 0.03s$$

$$\therefore 1500 = 268.75 + 0.03s$$

$$\therefore 1231.25 = 0.03s$$

$$\therefore \frac{1231.25}{0.03} = s$$

$$\therefore s = 41041.67$$

Jensen would have to have sales of \$41,041.67

4. The “We R’ Nuts” bulk food store sells cashews at \$20/kg and peanuts at \$10/kg. If the store wants to make a mixture of 500 kg of cashews and peanuts to sell for \$17/kg, how many kilograms of cashews and how many kilograms of peanuts must be in the mixture? (10 TIPS)

(a) Complete the following table. Remember that all quantities must be expressed in terms of *one variable*. If you use more than one variable you will not be able to solve this problem!

Quantity	Representation	Cost (Dollars)
Kilograms of Peanuts in the 500 kg mixture.	p	$10p$
Kilograms of Cashews in the 500 kg mixture.	$500 - p$	$20(500 - p)$
Total Kilograms of Nuts in the 500 kg mixture.	500	$17(500) = 8500$

(b) Translate the following sentence into an equation:
“In the 500 kg mixture, the cost of the peanuts *plus* the cost of the cashews *is* the total cost of the mixture.”

$10p + 20(500 - p) = 8500$

(c) Now solve the equation and state a conclusion.

$10p + 10000 - 20p = 8500$ ✓
 $\therefore -10p = -1500$ ✓
 $\therefore p = \frac{-1500}{-10} = 150$ ✓

The mixture contains 150 kg of peanuts and 350 kg of cashews. ✓



5. Hunar can eat all the potato chips in a large bag in 15 minutes while Saneh would take 25 minutes to eat the same amount of potato chips. How long would it take them to finish the chips if they shared one bag? (6 TIPS)

Hunar: eats $\frac{1}{15}$ bags/min ✓ Saneh: eats $\frac{1}{25}$ bags/min ✓

Together: $\frac{1}{15} + \frac{1}{25} = \frac{5+3}{75} = \frac{8}{75}$ bags/min ✓

Let t represent the time, in minutes, that it takes Hunar and Saneh to eat all the potato chips in one bag.

Fraction of a bag that is eaten in one minute (rate in bags/min) $\rightarrow$ time in minutes $\rightarrow$ 1 bag

$\therefore \frac{8}{75}t = 1$ ✓
 $\therefore \frac{75}{8}(\frac{8}{75}t) = \frac{75}{8}(1)$ ✓
 $\therefore t = \frac{75}{8} = 9.375$ (exactly) ✓

Together, Hunar and Saneh can eat all the potato chips in one bag in $\frac{75}{8}$ minutes (9.375 minutes, 9 minutes 22.5 seconds)