**PROBLEM SOLVING**

1. Miss Roxas bought 20 blouses for P1800 and marked them to sell at P110 each. After selling 16 pieces at this rate, she decided to sell the remaining blouses at a lower price. At what price may she sell each remaining blouse and still realize a gross profit of P360 on the 20 blouses?

   1. P100 2. P105 3. P110
   4. P115 5. P120

   **Solution:**
   No. of Blouses Bought = 20
   Original Price for 20 Blouses = 1800
   Original Price Per Blouse = 1800 / 20 = P 90
   Selling Price Per Blouse= P 110
   Gross Profit Per Blouse = Selling Price – Original Price = 20

   Gross Profit After Selling 16 pieces = No. of Blouse x Gross Profit per Blouse
   = 16 x P 20
   = P 320
   No. of Blouses Left = 20 – 16 = 4
   Goal: Gross Profit = P 360
   Needed Gross to get goal gross profit= Goal Gross Profit – Gross Profit for 16 pieces
   = P 360 – P 320
   = 40
   Needed Gross Per Blouse (for the 4 blouses) = P 40 / 4 = 10
   Selling Price Per Blouse (for the 4 Blouses) = Original Price Per Blouse + Needed Gross per Blouse
   = 90 + 10
   **= P100**

2. The Philippines and 19 other Asian nations decide to cut their oil consumption by two million barrels a day. If this is 5% of their daily oil consumption, how many barrels are consumed by these countries in one day?

   1. 400,000 2. 10,000.00 3. 40,000.00
   4. 100,000.00 5. 400,000.00

   **Solution:**
   2 Million Barrels = 5% of the daily consumption

   2M = 0.05 X

   $X = \frac{2M}{0.05} = \frac{2M}{\frac{5}{100}} = \frac{2M\ x\ 100}{5} = \frac{200M}{5} = 40M$

   The Answer is 40M or 40,000,000.00. it is not in the choices but we need to have an answer so the safe choice would be to shade 3. 40,000.00.

3. A development project which was financed by ecological organizations amounted to P 3.6 million. If there had been two more contributors, and the expenses were shared equally, it would have cost each organization P300,000 less. How many organizations contributed to the project?

1. 3 2. 4 3. 6
4. 9 5. 12

**Solution:**
Let x be the number of organization
Let y be the amount per organization
Problem: Find x

***Solution 1: using elimination of the multiple choices by substitution***
Equation 1: xy = 3,600,000
Equation 2: (x+2)(y-300,000) = 3,600,000

**Choice 1: x = 3**

Equation 1: 3y = 3,600,000
y = 1,200,000
Equation 2: (x+2)(y-300,000) = 3,600,000
(3+2)(y-300,000) = 3,600,000
(5)(y-300,000) = 3,600,000
(y-300,000) = 3,600,000/5
(y-300,000) = 720,000
y = 1,020,000

y in equation 1 and 2 is not equal therefore, choice 1 is not the answer.

**Choice 2: x = 4**

Equation 1: 4y = 3,600,000
y = 900,000
Equation 2: (x+2)(y-300,000) = 3,600,000
(4+2)(y-300,000) = 3,600,000
(6)(y-300,000) = 3,600,000
(y-300,000) = 3,600,000/6
(y-300,000) = 600,000
y = 900,000

y in equation 1 and 2 is not equal therefore, choice 2 is the answer.

***Solution 2: using algebra convention***
Equation 1: xy = 3,600,000
Equation 2: (x+2)(y-300,000) = 3,600,000

Find x, we need to eliminate y in equation 2.
Equation 1: $y = \frac{3,600,000}{x}$
Substitute in Equation 2: $(x+2)(\frac{3,600,000}{x}-300,000) = 3,600,000$
Simplify:

$$x\left(\frac{3,600,000}{x} - 300,000\right) + 2\left(\frac{3,600,000}{x} - 300,000\right) = 3,600,000$$

$$\left(\frac{3,600,000\cancel{x}}{\cancel{x}} - 300,000x\right) + \left(\frac{7,200,000}{x} - 600,000\right) = 3,600,000$$

$$(3,600,000 - 300,000x) + \left(\frac{7,200,000 - 600,000x}{x}\right) = 3,600,000$$

$$\left(\frac{3{,}600{,}000x-300{,}000x^2+7{,}200{,}000-600{,}000x}{x}\right)=3{,}600{,}000$$

$$3{,}600{,}000x-300{,}000x^2+7{,}200{,}000-600{,}000x=3{,}600{,}000x$$

$$0=\cancel{3{,}600{,}000x}-(\cancel{3{,}600{,}000x}-300{,}000x^2+7{,}200{,}000-600{,}000x)$$

$$300{,}000x^2+600{,}000x-7{,}200{,}000=0$$

$$(300{,}000x^2+600{,}000x-7{,}200{,}000=0)\frac{1}{300{,}000}$$

$$x^2+2x-24=0$$

(x – 4) (x + 6) = 0

x = 4, x = - 6 , The answer is 4, Eliminate x = - 6 since number of organization should be positive.

4. There are 36 reams of mimeographing paper in the drawer. If 1 ¼ dozens of reams of paper were to be used in printing, how many reams should be left in the drawer?

   1. 15 2. 20 3. 21
   4. 22 5. 23

5. A group of men went on fishing trip, agreeing that each should pay the same amount. The total bill was P168. If there had been two fewer men, each man would have had to pay 2 pesos more. How many men went fishing?

   1. 15 2.14 3.13 4.12 5. 8

6. The ceiling of a building, 18 meters by 15 meters, is to be painted. How many gallons of paint are required for this ceiling if a gallon can cover 15 square meters?

   1. 15 2.18 3.20 4.27 5. 36

7. A square and a rectangle have equal areas. If the rectangle is 36 by 16, what is a side of a square?

   1. 24 2. 26 3.29 4.34 5. 36

8. Ana gets a commission of 10% for each bottle of lotion she sells. If a bottle of lotion sells for P87.50, how many bottles will Ana have to sell to receive a commission of P210?

   1. 20 2.24 3.36 4.38 5. 40

9. What is the sum of series of arithmetic progression having a common difference of 3.5, if the first term is 0.5 and the last term is 25?

   1. 17.15 2. 25.55 3. 53.4 4. 174.5 5.none of these

   *Answer is 102*

10. If the sum of 5 consecutive numbers is 95, what is the third number?

1. 17 2. 18 3.19 4.20 5. 21

11. Two numbers are in the ratio of 3 to 5. The lesser number is 42. Find the greater number.

1. 70 2. 75 3.112 4.126 5. 252

12. The total area of a cube is the sum of its lateral area and the area of its bases. If the edge of a cube is 4, find its total area.

1. 96 2. 64 3.48 4.32 5. 24

13. If a can of paint will cover approximately 60 square yards, what length of the wall can be painted if the wall is 8 feet high?

1. 12 feet 2.10 feet 3.6 feet4. 5 feet 10 inches 5.none of these

1 yard = 3 ft, answer is 67.5 ft

14. One million is to be divided among the 3 children of a widower in the ratio of 10:12:18. By how much is the largest share greater than the smallest share?

1. P300,000 2. P200,000 3. P150,000
4. P100,000 5. P50,000

*Soln: Shares are 10:40, 12:40 and 18:40.*

15. Division and section heads of agency Y who come late during their monthly staff meetings are fined. The first latecomer pays P0.50, the second latecomer pays P1.00, the third pays P1.50, the fourth pays P2.00 and so forth. If 13 came late during their last meeting, how much money was collected from them?

1. P6.50 2.P P45.50 3. P65.00
4. P84.50 5. P104.50

16. The first day, a contractor hired 11 carpenters, 3 masons and 5 helpers. The second day, he hired 6 carpenters, 5 masons and 2 helpers. The third day, he hired 5 carpenters, 3 masons, and 3 helpers. If his payroll was 194 the first day, P137 the second day, and P112 the third day, how much did he pay each mason a day?

1. P8 2. P29 3. P10
4. P12 5.none of these

Answer: carpenters = 11, masons = 11, helpers = 8

17. In an illustration, one unit represents a line 85 centimeters long. How many meters long of a line will be represented by 150 units?

1. 1.275 2. 12.75 3. 127.50
4. 1,275 5. 12,750

18. If the management of a parking lot charges its customer P10.00 for the first two hours and P5.00 for each additional hour or a part thereof; then the cost for parking for 4 hours and 45 miutes is _____.

1. P15.00
2. P23.75
3. P25.00
4. P35.00
5. P45.00

19. A bureau director has an appointment at 9 A.M. in a nearby province. If he travels at 40 kph., he will arrive at 8 AM. If he drives at 30 kph., he will not arrive until 8:45 A.M. How far away is the province?

1. 30 km
2. 37.5 km
3. 50 km
4. 90 km
5. 225 km

20. Which of the following has the greatest discounts?

1. a discount of 1/3 of the selling price pf P200
2. 33.3% of the selling price of P200
3. 0.3 discount of the selling price of P200
4. a discount of 200
5. none of the above

*I'm not sure of the answer, but I would answer none of the above instead of choice number 4: a discount of 200 since the original value to where the P200 discount is unknown, it may be a thousand or a million. Options 1 and 2 are equal and 3 is lower than 33.3%.*