

2019 Metrobank-MTAP-DepEd Math Challenge Division Finals-Team Oral Competition Grade 8

15-Second Questions [2 points each]

- If $25^x = \frac{5^{x-2}}{3^{x+2}}$, find x . $[-2]$
- Solve for x in the equation $|3x - 2| = 4$. $[x = 2, -\frac{2}{3}]$
- A computer screen saver displays circle of radius 2 cm and enlarges it. What is the radius of the new circle if its area is four times the original? [4]
- Factor completely: $6x^3 + x^2 - 2x$ $[x(2x - 1)(3x + 2)]$
- Find the solution set of $\frac{2}{3}x < 3x + \frac{2}{9}$. $[(-\frac{2}{21}, \infty)]$
- If $f(x) = \frac{x}{1-x}$, find $f(1-x)$. $[\frac{1-x}{x}]$
- Write $\frac{6x^2}{x^2-9} - \frac{3x}{x-3}$ as a single fraction in lowest terms. $[\frac{3x}{x+3}]$
- Find c so that the line $3x + 4y + 2c = 0$ passes through the point $(2, -5)$. [7]
- In a game show, the winner spins a wheel to determine his prize. The prize wheel is divided into 5 equal wedges that are labelled Php10,000, Php15,000, Php20,000, Php25,000, and Php30,000. What is the probability that after spinning the wheel once, the winner gets at most Php20,000? $[\frac{3}{5}]$
- In an isosceles triangle, the length of each leg is 3 cm. What is the length of the altitude to the hypotenuse of the triangle? $[\frac{3\sqrt{2}}{2}]$
- What is the slope of the line with x -intercept 5 and y -intercept $\frac{3}{7}$. $[-\frac{3}{35}]$

30-Second Questions [3 points each]

- Write the expression $(\frac{x^{-1}y^{-1}}{x^{-1}-y^{-1}})^{-1}$ in lowest terms with only positive exponents. $[y-x]$
- Divide $\sqrt{6} - \sqrt{3}$ by $\sqrt{6} + \sqrt{3}$ and express quotient in simplest form. $[3 - 2\sqrt{2}]$
- Write an equation of the line that is parallel to $2x - 3y + 5 = 0$ and which passes through the point $(-2, 5)$. $[2x - 3y + 19 = 0]$
- Factor completely: $(x + 2y)(x + 2y - 1) - 6$ $[(x + 2y - 3)(x + 2y + 2)]$
- In how many ways can a 6-digit PIN be formed if the first digit cannot be zero and the last digit cannot be the same as the first digit? [810,000]
- A BPO company employs full time and part time call center agents. Let F be the number of full time agents and let P be the number of part time agents that the company employs at any given time. From the volume of calls received daily by the company and the average handle time of the agents, F and P must satisfy the inequality $7F + 5.5P \leq 753$. If the company employs 75 full time agents, how many part time agents at most can the company hire? [46]

1-Minute Questions [5 points each]

- A number x is 15% more than y and a number z is 20% more than x . How many percent more than y is z ? [38%]
- The sum of 3^x and its reciprocal is a . What is the sum of 9^x and its reciprocal in terms of a . $[a^2 - 2]$
- A car and a bus approach the same intersection from roads which are perpendicular. If the car averages 60 kph and the bus 80 kph, what is the distance between the car and the bus 12 minutes after they cross the intersection? [20 km]
- A function f is defined on the set of positive integers as follows: $f(1) = 1$ and for all integers $n \geq 2$, $f(n) = f(n-1) - 2$. Find $f(5)$. [-7]
- In the figure, angles and sides have measures as indicated but are not drawn to scale. Arrange A, B, C, D, E in increasing order. $[A, B, E, C, D]$



- The fare for an aircon bus in Metro Manila is computed as follows: Php11 for the first 5 kilometers, then Php1.85 for each succeeding kilometer or a fraction thereof. Compute the bus fare for a distance of 10.5 kilometers. [Php22.10]

Clincher Questions

- Find the solution set of $3|x| = x - 1$. [empty set]
- If $9^y = 81(3^{2x})$ and $x + y = 4$, what is the value of 9^{xy} ? [729]
- Find the range of values of the function $f(x) = \frac{5x+1}{x+3}$ if the domain is restricted to $x \geq 0$. Write your answer in interval notation. $[[\frac{1}{3}, 5))$

Do-or-Die Question

Find the solution set of the inequality $4 - 2x \leq 2x + 5 \leq 3 - 6x$ $[-\{\frac{1}{4}\}]$