

Name: \_\_\_\_\_ School: \_\_\_\_\_ Score: \_\_\_\_\_

**Instruction:** Write your answer on the space provided before each item. Give all fractions in lowest terms and if applicable, write all expressions in expanded form.

- \_\_\_\_\_ 1. Bela is 5 feet 3 inches tall. Convert her height to meters.
- \_\_\_\_\_ 2. Convert 1.5L to mL.
- \_\_\_\_\_ 3. Evaluate  $3x^2 - 2y^3$  when  $x = 2$  and  $y = -1$ .
- \_\_\_\_\_ 4. Evaluate  $(2^3)^2 - 2^3 3^2$ .
- \_\_\_\_\_ 5. Arrange in increasing order:  $\frac{22}{7}$ , 3.15,  $\sqrt{3}$ ,  $\pi$
- \_\_\_\_\_ 6. Find the product  $(5.71 \times 10^{-8})(1.28 \times 10^{-12})$ . Round your answer with the appropriate number of significant digits.
- \_\_\_\_\_ 7. The conversion formula from Fahrenheit to Celsius is  $C = \frac{5}{9}(F - 32)$ . At what temperature are  $F$  and  $C$  equal?
- \_\_\_\_\_ 8. Convert the repeating decimal 0.14141414... into a fraction.
- \_\_\_\_\_ 9. The minimum speed for expressways and highways in the Philippines is 60 km/h. Calculate to the nearest ones the distance in meters that a car travels in 1 second.
- \_\_\_\_\_ 10. Express the decimal 2.125 in fraction form (as a quotient of two integers).
- \_\_\_\_\_ 11. Express  $4\frac{3}{8}$  as a decimal.
- \_\_\_\_\_ 12. Find the greatest integer less than  $6\sqrt{2}$ .
- \_\_\_\_\_ 13. Simplify  $\frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{4}}$ .
- \_\_\_\_\_ 14. Translate "4 less than thrice the square of a number  $x$ " to a mathematical expression.
- \_\_\_\_\_ 15. Subtract  $3(-x^2 + 6xy - 4) - 2y^2 + 9$  from  $12 - 2y(y - 9x) + x^2$ .
- \_\_\_\_\_ 16. Find the product  $(x - 2y + z)(x + 2y - z)$ .
- \_\_\_\_\_ 17. Find the quotient and remainder when  $x^2 + xy + y^2$  is divided by  $x - y$ .
- \_\_\_\_\_ 18. Divide  $x^6 - y^6$  by  $x^4 + x^2y^2 + y^4$ .
- \_\_\_\_\_ 19. What is the value of  $x^2 - x + \frac{1}{x}$  if  $x = \frac{1}{2}$ ?
- \_\_\_\_\_ 20. Assume  $x \neq 0$  and  $x \neq -1$ , simplify  $(x^3 + 1)^{-1} + (x^{-3} + 1)^{-1}$ .
- \_\_\_\_\_ 21. Assume  $x$  is positive. What is the length of each side of a square if its area is  $4x^2 + 20x + 25$ ?
- \_\_\_\_\_ 22. Find the solution set of  $(6x - 5)(x + 1) = (2x - 7)(3x - 1)$ .
- \_\_\_\_\_ 23. If  $|x - \frac{1}{2}| \leq 8$ , what is the minimum value of  $2x + 1$ ?
- \_\_\_\_\_ 24. If  $x + y = 7$  and  $xy = 10$ , what is the value of  $x^2 + y^2$ ?
- \_\_\_\_\_ 25. Solve the inequality  $6(x - 2) - 8x < 3x - 2(x + 7)$ . Express your answer in interval notation.
- \_\_\_\_\_ 26. Find the product of  $\sqrt{3 + \sqrt{5}}$  and  $\sqrt{3 - \sqrt{5}}$ .

27. Find the value of  $\phi^2 - \phi$  if  $\phi = \frac{1+\sqrt{5}}{2}$ .

28. How many sides does a regular polygon have if the sum of its interior angles is  $1080^\circ$ ?

29. What is the mean of the data set 2, 4, 7, 7, 10?

30. Find the standard deviation of the data set in the preceding item.

31. Assume that the volume of a cube is  $(x - 2y)^3$ . Expand this product.

32. Find  $A - (A \cap B)$  if  $A = \{1, 2, 4, 6, 8\}$  and  $B = \{1, 2, 3, 6, 9\}$ .

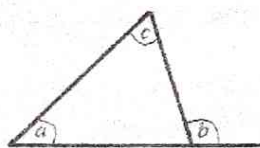


Figure 1

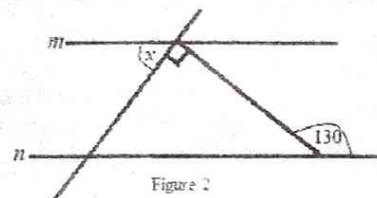


Figure 2

33. In Figure 1,  $a = 24^\circ$  and  $b = 95^\circ$ . Find  $c$ .

34. Given Figure 2 as marked, find  $x$  so that lines  $m$  and  $n$  are parallel.

35. Half the measure of an angle is twice the measure of its supplement. What is the measure of the angle?

For the next three items, assume 10 students got the following test scores: 58, 98, 81, 59, 67, 81, 94, 84, 46, 32

36. Find the median of the scores.

37. Find the mode of the scores.

38. What is the range of the scores?

39. Solve the equation  $\frac{11}{x+1} - \frac{3}{x-1} = \frac{10}{x^2-1}$ .

40. A rectangular lot has length equal to 5 less than twice its width. One of the longer sides is against the wall so that only the three remaining sides needed fencing material. Find the dimensions of the lot if 35 meters of fencing material were used.

41. Assume  $\frac{a}{b} = \frac{a-x-y}{b-z}$ . If  $x+y=4$  and  $z=3$ , what is the value of  $\frac{a}{b}$ ?

42. The advertised prices of goods in a clothes store include a 12% value added tax. How much goes to tax for a shirt with a tag price of Php 392?

43. Two angles measuring  $x$  and  $y$  form a linear pair. Find  $x$  if  $y = 2x + 30$ .

44. What is the measure of each exterior angle of a regular dodecagon?

45. The measures of the angles of a triangle are in the ratio 2 : 3 : 4. What is the measure of the largest angle?

46. The mean of six consecutive odd integers is 4. What is the smallest of the six integers?

47. Baby Arya's birth weight is 5 lbs and 8 oz. Estimate her weight in kg to the nearest tenth if 1 lb = 0.45 kg and 1 oz = 0.03 kg.

48. A direct flight from Manila to Tokyo leaves Manila at 12:50 am and arrives in Tokyo at 06:10 am on the same day. If Japan time is one hour ahead of Philippine time, how many hours does it take to fly from Manila to Tokyo?

49. The regular admission rate for a musical is Php 850. For students, senior citizens and persons with disability, the discounted rate is Php 400. The number of tickets sold at the regular rate is 220 less than twice the number sold at the discounted rate. If the total ticket sales is Php 590,000, how many tickets were sold at the discounted rate?

50. The ratio of the area to the circumference of a circle is  $\frac{5}{4}$ . What is the circumference of the circle?

# Metrobank-MTAP-DepEd Math Challenge 2019

## Grade 7 Elimination Round Key

**Instruction Given:** Give all fractions in lowest terms and if applicable, write all expressions in expanded form.

- |  |                                   |
|--|-----------------------------------|
| 1. 1.6 meters                                    | 26. 2                             |
| 2. 1500 mL                                       | 27. 1                             |
| 3. 14  | 28. 8                             |
| 4. -8  | 29. 6                             |
| 5. $\sqrt{3}$ , $\pi$ , $\frac{22}{7}$ , 3.15    | 30. 2.75                          |
| 6. $7.31 \times 10^{-20}$                        | 31. $x^3 - 6x^2y + 12xy^2 - 8y^3$ |
| 7. -40   | 32. {4, 8}                        |
| 8. $\frac{14}{99}$                               | 33. $71^\circ$                    |
| 9. 17 m  | 34. $40^\circ$                    |
| 10. $\frac{17}{8}$                               | 35. $144^\circ$                   |
| 11. 4.375  | 36. 74                            |
| 12. 8  | 37. 81                            |
| 13. $\frac{2}{3}$                                | 38. 66                            |
| 14. $3x^2 - 4$                                   | 39. $x = 3$                       |
| 15. $4x^2 + 15$                                  | 40. 10 m $\times$ 15 m            |
| 16. $x^2 - 4y^2 - z^2 + 4yz$                     | 41. $\frac{4}{3}$                 |
| 17. $x + 2y + \frac{3y^2}{x-y}$ <i>xy r. 3yz</i> | 42. Php 42                        |
| 18. $x^2 - y^2$                                  | 43. 50                            |
| 19. $\frac{7}{4}$                                | 44. 30                            |
| 20. 1  | 45. $80^\circ$                    |
| 21. $2x + 5$                                     | 46. -1                            |
| 22. $\{\frac{1}{2}\}$                            | 47. 2.5 kg                        |
| 23. -15  | 48. 14.5 hours                    |
| 24. 29   | 49. 370                           |
| 25. $(\frac{2}{3}, \infty)$                      | 50. $5\pi$                        |