

Metrobank-MTAP-DepEd Math Challenge 2016
Elimination Stage, Grade 9

Name: _____ School: _____ Score: _____

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

- _____ 1. Solve for x in $\sqrt{2-x} - 4 = 0$.
- _____ 2. Find $\sin \theta$ if $\tan \theta = \frac{3}{4}$ and $\cos \theta < 0$.
- _____ 3. What is the value of $\tan\left(-\frac{17}{6}\pi\right)$?
- _____ 4. Solve for x in $\frac{5}{x+2} - \frac{2}{x+1} = \frac{1}{2}$.
- _____ 5. Solve for x in $x^4 - 4x^2 - 5 = 0$.
- _____ 6. Find the sum of the first 20 positive odd numbers.
- _____ 7. Solve for x in $x^2 + 12 < 7x$.
- _____ 8. Find all possible values of x if one of the interior angles of a square is $(2x^2 - 8x)^\circ$.
- _____ 9. What is the sum of the interior angles of a pentagon?
- _____ 10. The supplement of an angle is four times its complement. Find the angle.
- _____ 11. What is the shortest side of $\triangle PQR$ if $\angle P = 57^\circ$ and $\angle Q = 67^\circ$?
- _____ 12. Rationalize the denominator and simplify: $\frac{2\sqrt{2}}{\sqrt{6}+\sqrt{2}}$.
- _____ 13. Find the 25th term of the arithmetic sequence whose first 3 terms are 4, 7, and 10.
- _____ 14. Solve for x in $\sqrt{2x+1} - \sqrt{x} = 1$.
- _____ 15. For what value/s of x is $x^2 - 8x + 18 \geq 0$?
- _____ 16. In $\triangle ABC$, $\angle B = 90^\circ$ and $\sin A = \frac{3}{4}$. Determine the value of $\tan C$.
- _____ 17. The angle bisector at vertex B of $\triangle ABC$ meets AC at D . If $BC = 6$, $AC = 40$, and $CD = 15$, find AB .
- _____ 18. Find the equation of the line parallel to $4x + 3y = 12$ and passing through $(-12, 4)$.
- _____ 19. Express in terms of sines or cosines of θ and simplify: $\cot \theta \sec^2 \theta$.
- _____ 20. Find the common ratio of a geometric sequence whose first term is -2 and the 7th term is -1458.
- _____ 21. Solve for x in $4\sqrt{3x+1} = 4x + 3$.
- _____ 22. Find the 7th term of the geometric sequence: 8, 12, 18,
- _____ 23. Triangle ABC is a right triangle with $C = 90^\circ$. If $A = 60^\circ$ and $a = 50$, find b .
- _____ 24. Two of the exterior angles of a regular polygon have measure $(6x - 30)^\circ$ and $(114 - 10x)^\circ$. How many sides does this regular polygon have?
- _____ 25. Solve for x in $\frac{3}{2x-1} - \frac{2}{x} = 0$.
- _____ 26. Find x so that $x - 2$, $x + 2$, and $x + 4$ are consecutive terms of a geometric sequence.
- _____ 27. What is the smallest positive angle which is co-terminal to -1125° ?
- _____ 28. What is the height of an equilateral triangle whose perimeter is 6 meters?
- _____ 29. By what factor is the volume of a cube increased if each of its sides is tripled?
- _____ 30. z varies directly as x and varies inversely as the square of y . If $z = \frac{7}{2}$ when $x = 14$ and $y = 6$, find z when $x = 27$ and $y = 9$.
- _____ 31. Express in terms of sines or cosines of θ and simplify: $\frac{\cot^2 \theta + 1}{\tan^2 \theta + 1}$