



2018 Metrobank-MTAP-DepEd Math Challenge  
Division Finals-Team Oral Competition  
Grade 9

15-Second Questions [2 points each]

1. What value of the constant  $c$  will make  $x^2 - 16x + c$  a perfect square? [64]
2. Solve for  $x$  in the quadratic equation  $x^2 + 4x - 5 = 0$ . [ $x = -5, 1$ ]
3. What is the sum of the roots of  $3x^2 + 12x + 2 = 0$ ? [-4]
4. Simplify the expression  $\frac{1}{8}x^5$ . If  $x = 3$  when  $y = 2$ , find  $x$  when  $y = 5$ . [ $\frac{1}{8}x^2\sqrt{x}$ ]<sup>5</sup>
5. Suppose  $y$  varies inversely as  $x$ . If  $x = 3$  when  $y = 2$ , find  $x$  when  $y = 5$ . -
6. The diagonals of a rhombus are 6 cm and 10 cm. Find the area of the rhombus. [30 cm<sup>2</sup>] -
7. In a parallelogram, two adjacent angles have measures  $(2x + 3)^\circ$  and  $(4x - 3)^\circ$ . Find  $x$ . [30]
8. If  $x^{0.234} = 2$ , what is 3 more than  $x^{0.468}$ ? [7]
10. How long is the hypotenuse of a right triangle if its two legs are 2 cm and 3 cm? [ $\sqrt{13}$  cm]
9. If  $a:b = 3:1$  and  $b:c = 3:1$ , find the ratio  $a:c$ . [9:1]
11. Find the vertex of the graph of  $y = x^2 - 2x + 4$ . [(1, 3)]
1. Simplify:  $5\sqrt{27} - 3\sqrt{12}$  [9 $\sqrt{3}$ ]

30-Second Questions [3 points each]

2. If  $6x + 7 = (x + 2)^2$ , solve for  $x$ . [ $x = -1, 3$ ] -
3. Find the range of values of  $k$  if  $x^2 + kx + 5k = 0$  has no real roots. [ $0 < k < 20$  or  $(0, 20)$ ]
4. In a triangle, a line parallel to the base divides one side into segments 6 and 15 units long. If the other has length 35, how long (in units) is each segment formed when the line divides this side? [10, 25]
5. Isosceles trapezoid ABCD has parallel bases AB and CD, and the diagonals intersect at E. If  $AE = 10$ ,  $BE = 3x - 2$  and  $DE = 4x + 1$ , how long in units is CE? [17]
6. The diagonals of a rhombus are 24 and 32. Find the length of each side. [20]

1-Minute Questions [5 points each]

1. Triangle ABC has a right angle at C. Let D be the foot of the altitude from C to AB. If  $AC = 12$  and  $AD = 8$ , find the length in units of BD. [ $x = 36$ ]<sup>3</sup> [10]
2. Solve for  $x$  in the equation  $\sqrt{x} + 1 = \sqrt{x + 13}$ . -
3. Suppose  $z$  varies directly as the square of  $x$  and inversely as  $y$ . If  $z = 2$  when  $x = 1$  and  $y = 1$ , find  $z$  when  $x = 3$  and  $y = 4$ . [ $z = 6$ ] -
4. Fencing material that is 300 m is to be used to enclose 3 sides of a rectangular lot. What are the dimensions of such a lot with the largest possible area? [75 m, 150 m]
5. Find the smallest positive value of  $x$  which satisfies  $(3x + 1)^2 + 10x \geq 3(x + 1)^2 + 2$ . [ $x = 1$ ]<sup>3</sup> -
6. The shortest sides of two similar triangles are 2 cm and 5 cm. If the perimeter of the bigger triangle is 20 cm, find the perimeter of the smaller one. [8 cm]

C.2. Rationalize  $1 + \sqrt{3}$   
Clincher Questions

- C.1. Find the smallest positive integer solution of  $x^2 - 2x - 15 \geq 0$ . [5]

- C.3. If  $r$  and  $s$  are the roots of  $3x^2 - 5x + 1$ , find the value of  $r^2 + s^2$ . [19]

**Do-or-Die Question**

If  $x^2 + y^2 = 7$ , find the value of  $x^4 + 2x^2y^2 + y^4$ .

[49]

This is a property of the Metrobank-MTAP-DepEd Math Challenge.

This material is not for sale, reproduction and/or distribution. Copyright 2018

---

9.1 Triangle ABC has a right angle at C. Let D be the foot of the altitude from C to AB. If AC = 12 and AD = 8, find the length in units of BD.

9.2 Solve for  $x$  in the equation  $\sqrt{x+1} = \sqrt{x+13}$ .

—

9.3 Suppose  $z$  varies directly as the square of  $x$  and inversely as  $y$ . If  $z = 2$  when  $x = 1$  and  $y = 1$ , find  $z$  when  $x = 9$  and  $y = 4$ .

—

9.4 Fencing material that is 300 m is to be used to enclose 3 sides of a rectangular lot. What are the dimensions of such a lot with the largest possible area?

9.5 Find the smallest positive value of  $x$  which satisfies  $(3x+1)^2 + 10x \geq 3(x+1)^2 + 2$ .

9.6 The shortest sides of two similar triangles are 2 cm and 5 cm. If the perimeter of the bigger triangle is 20 cm, find the perimeter of the smaller one.

9.C.3 If  $r$  and  $s$  are the roots of  $3x^2 - 5x + 1$ , find the value of  $r^2 + s^2$ .

9.DoD. If  $x^2 + y^2 = 7$ , find the value of  $x^4 + 2x^2y^2 + y^4$ .

This is a property of the Metrobank-MTAP-DepEd Math Challenge.  
This material is not for sale, reproduction and/or distribution. Copyright 2018

---