Name _____ Period _____ Score _____ **#34 b**

Honors Math 8 - "Solving Square and Cubic Equations"

1. Find the square roots:

   $\sqrt{400}$

   $\sqrt{0.49}$

   $\sqrt{\frac{4}{9}}$

   $\sqrt{5^{10}}$

2. Simplify: $\sqrt{100-64}-(\sqrt{100}-\sqrt{64})$

3. The area of a square with sides of length s is given by the formula $A = s^2$, where A is the area and s is the length of one side. If the area of a square is 441 square inches, what is the length of one side?

4. The formula $d = 16t^2$, where d is the distance in feet and t is the time in seconds, relates time and distance for falling objects. Calculate the time required to drop a ball from a height of 400 feet.

5. The formula $a = 2s^2$, where a is the area of any rectangle with one side length s, and one side twice as long, relates dimension and area of such rectangles.

   Calculate the side length of such a rectangle if the area is 288 square units.

6. Suppose you were asked for the radius of a circle whose area is $16\pi\ \text{m}^2$. Would your answer include the positive square root of 16, the negative square root, or both? Explain.

7. To find a perfect square, we most commonly multiply a number by itself, for example $6 \times 6 = 36$. Another way to find a perfect square is to multiply four consecutive integers and then add the number 1 to the product. For example $2 \times 3 \times 4 \times 5 + 1 = 121$, which is a perfect square. Use this method to find three other perfect squares.

8. Find: $\sqrt{\frac{36}{49}}$

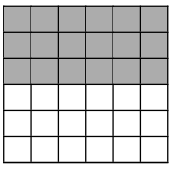
9. Evaluate the expression using the standard order of operations:

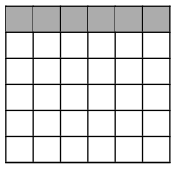
   $\left(\sqrt{64}+4\right) \div 9^{\frac{1}{2}}$

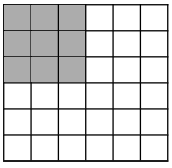
10. The formula for finding the surface area of a cube is $SA = 6s^2$. If the surface area of a cube is 384 , how long is each side?

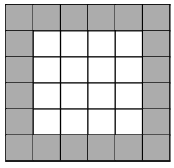
11. What is the value of $(\sqrt{25})^2$?

12. In which of these models does the shaded portion represent $\sqrt{36}$?

A. 

B. 

C. 

D. 

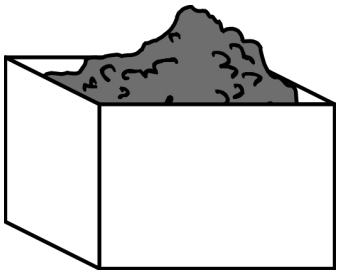
13. Marcus knows that a cubed shaped bin at the nursery holds 1000 cubic feet of dirt. Which expression can he use to calculate the length of an edge of the bin?

A. $\sqrt[3]{1000}$

B. 1000×3

C. $1000 \div 3$

D. $1000 \div 6$



14. Write $4.01\overline{2}$ as a rational number.

15. Place a mark in every box that describes the number.

If a number is Rational, explain.

Number	Rational	Irrational
$-\pi$		
–11.1689		
$\lvert\sqrt{169}\rvert$		
$\frac{5}{3}$		
$4\sqrt{5}$		
$\sqrt{101}$		

Give reasons for your sorting.

16. Solve each of the following radical equations.

a) $\dfrac{c^2}{0.8} = 80$

b) $n^3 + 7 = 350$

c) $2x^2 + 34 = 2$

17. Which of these numbers would, as the denominator of a reduced fraction, lead to a *terminating* decimal form?

A. 12 B. 14 C. 16 D. 18

18. An *irrational* number is a number that is—

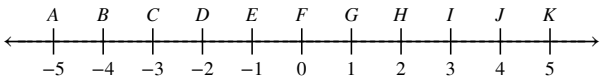
19. Classify the following list of real numbers by category. (Some numbers may fit in more than one category.)

$-7 \quad \frac{1}{2} \quad -0.6 \quad 1.67342\ldots$

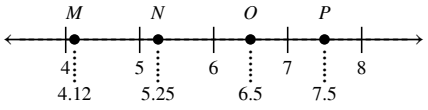
$\sqrt{25} \quad 3^2 \quad \frac{5}{11} \quad 12 \quad \sqrt{3} \quad 0$

Whole	Integer	Rational	Irrational

20. $\sqrt{20}$ is located between which of the letters on the number line?



21. Which integer is the closest to $\sqrt{38}$?



A. 7 B. 6 C. 5 D. 4

22. Insert a rational and an irrational number between the following decimals.

$1.274\overline{4}$

_____ (rational)

_____ (irrational)

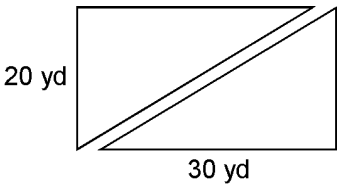
$1.274\overline{274}$

23. Estimate $\sqrt{115}$ to the nearest tenth without using a calculator. Explain in words the procedure you used to come up with your estimate.

24. Find two consecutive whole numbers that the following is between:

$\sqrt{125}$

25.



A vacant lot measures 20 yd by 30 yd. The neighborhood kids have cut a diagonal path through the lot. The exact length of this path is $\sqrt{20^2 + 30^2}$ yd. What is the approximate length of the path?

26. A square garden has an area of 5 square feet. To the nearest tenth of a foot, what is the length of one side of the garden?

27. The volume of a cube is 138 cubic centimeters. Which of the following is the best estimate for the length of an edge of the cube?

A. between 5 cm and 6 cm

B. between 6 cm and 7 cm

C. between 7 cm and 8 cm

D. between 8 cm and 9 cm

28. $\sqrt{180}$ is between what pair of consecutive integers?

29. The coordinate $(3, 5)$ is *not* the solution to which system of equations?

A. $y = 2x - 1$
$y = x + 2$

B. $y = x + 4$
$2y = 3x - 6$

C. $y = 3$
$y = x + 2$

D. $y = 8 - x$
$3y - 9 = 2x$

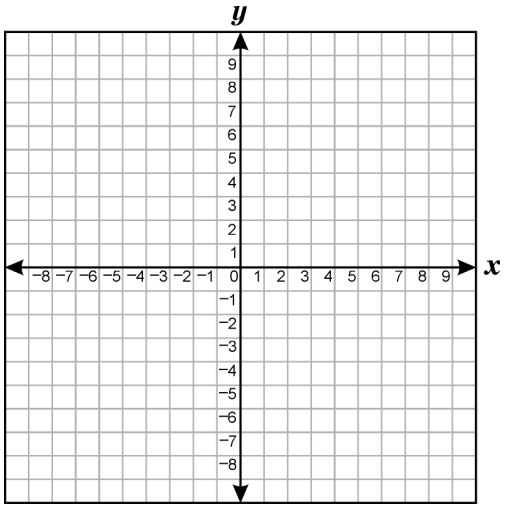
30. Solve: $3x - 4y = 6$
$3x - 2y = 2$

31. Which point does *not* belong to the solution set of the given system?

$3x - y > 6$
$4x + y \geq -4$

A. $(1, -5)$ B. $(2, -2)$ C. $(3, -4)$ D. $(4, 6)$

32. Graph the solution to $6x + 2y \geq 4$.



33. Evaluate: $16^{\frac{3}{2}}$

34. Simplify: $(-2x^4)^3$

35. Simplify: $\left(3a^4\right)^2\left(-2ab^2\right)^3$

36. Using the operations symbols, " $\times$, $-$, $\div$, and $+$", each once and the standard order of operations, make the following statement true:

$\sqrt{36}$____$\sqrt{121}$____$\sqrt{225}$____$\sqrt{25}$____$\sqrt{4} = 11$

37. Simplify: $\sqrt{48}$

38. Simplify: $\sqrt{27}$

39. Simplify: $\sqrt{120}$