

Middleton 1/10/04

January Regional Algebra I Team Questions for Sponsor's Packet

1. How many of the following statements are true?

- A. 5 is a natural number.
- B. $-\frac{1}{2}$ is an integer.
- C. $\sqrt{\frac{4}{9}}$ is an irrational number.
- D. π is a real number.
- E. If you subtract two whole numbers, the difference will be a whole number.
- F. The square root of a rational number is always rational.
- G. All counting numbers are whole numbers.
- H. All rational numbers are integers.

2. If $6(2x - 3) = 3(5x + 4)$ and $-\frac{y}{4} + 5 = \frac{3y}{4} - 6$, then find $|xy|$

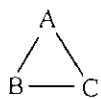
3. How many of the statements below are true?

- A. For any real number a , $a + 0 = a$ by the identity property for addition.
- B. For any real number k , $k \cdot \frac{1}{k} = 1$ by the identity property for multiplication.
- C. For all real numbers a , b , & r , if $a = b$, then $ar = br$ by the distributive property.
- D. For all real numbers u , v , & w , $(uv)w = w(uv)$ by the associative property for multiplication.
- E. For any real number n , $n = n$ by the reflexive property of equality.
- F. For all real numbers c & d , $c + d = d + c$ by the symmetric property of equality.

4. The expression below can be simplified in the form $ax^2 + bx + c$. Find $\frac{ab}{c}$ in simplest form.

$$9(x + 3)(x - 3) - (2x + 5)(3x - 1)$$

5.



is defined to be $AB + AC - BC$.



If equals 0 and



equals 0, find $x + y$.

6. Let u be the greatest common factor of 24, 32, & 56. Let v be the least common multiple of 8, 10, & 12. Find $\frac{u}{v}$ in simplest form.

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7. The point (3,5) lies on the graph of $ax - 4y = 7$. Let b be the y-intercept of $ax - 4y = 7$. Find $a + b$ in simplest form.

8. If $x^2 + y^2 = 2$ and $x^2 - y^2 = 2$, then find $x^4 - y^4$.

9. A solution contains 3 mL of acid and 27 mL of water (water is neutral). How many milliliters of acid would need to be added to make the solution that contains 20% acid? Express the solution in simplest form.

10. Mary left her home to visit her sister. The trip to her sister's house took longer than her trip back home. She took the same route to and from her sister's house. Mary traveled at an average speed of 50 miles per hour to her sister's house and 60 miles per hour from her sister's house. The total travel time was 10 hours. Find the total distance in miles traveled from Mary's house to her sister's house and back to Mary's house.

11. If $4^m = 16^6$ and $\left(\frac{1}{4}\right)^n = 8^2$, find mn .

12. If $a:b$ is 2:5, $c:d$ is 5:2, and $d:b$ is 3:2. What is $a:c$ in simplest form?

13. If $x^2 + 4y^2 = 25$ and $2xy = 12$, find $(x + 2y)^2$

14. Simplify: $\frac{27^{2x} \cdot 9^{3x}}{81^{3x}}$.

15. Find $A + B + C$:

$$\begin{array}{r} 12A \\ 4B5 \\ +C37 \\ \hline 975 \end{array}$$