

Multiple Choice: Circle the letter of the correct answer. Show all necessary work in the space provided.

1. When $A = -9$ and $B = -6$, which expression has a value of -3 ?

- | | | | |
|------------------------------------|--|--|--|
| A. $A + B$
$-9 + (-6)$
-15 | B. $ A + B $
$ -9 + (-6) $
$ -15 $
15 | C. $A - B$
$-9 - (-6)$
$-9 + 6$
-3 | D. $ A - B $
$ -9 - (-6) $
$ -9 + 6 $
$ -3 $
3 |
|------------------------------------|--|--|--|

2. Which value is a whole number but *not* a natural number?

- | | | | | |
|----------|-------------|-----------|----------|---|
| 1 | π | -2 | 0 | |
| A. 1 | B. π | | | 1: natural, whole, integer, rational, real |
| C. -2 | D. 0 | | | π: irrational, real |
| | | | | -2: integer, rational, real |
| | | | | 0: whole, integer, rational real |

3. Solve: $\frac{1}{3}(2t - 3) = t - 9$

- A. $t = 6$ B. $t = -24$
C. $t = 24$ D. $t = 30$

$$\begin{aligned} \frac{1}{3}(2t - 3) &= t - 9 && \frac{2}{3}t - 1t \\ \frac{2}{3}t - 1 &= t - 9 && \frac{2}{3}t + (-1t) \\ &+1 && +1 \\ \frac{2}{3}t &= t - 8 && \frac{2}{3}t + \frac{-3}{3}t \\ -1t &-1t && -\frac{1}{3}t \\ -\frac{1}{3}t &= -8 && \\ -\frac{3}{1} \cdot -\frac{1}{3}t &= -8 \cdot -3 && \\ \mathbf{t} &= \mathbf{24} && \end{aligned}$$

(see work)

This problem can also be done by substituting each value of t given by letters A - D into the equation. After substituting the value, evaluate both sides of the equation to see if the value makes the statement true.

4. All of the expressions below are equivalent to $\frac{3^{-8}}{3^{-4}}$ **except**

- A. $\frac{1}{81}$ B. $3^{-8} \cdot 3^4 = 3^{-8+4} = 3^{-4}$
C. 1^{-4} D. $1 \div 3^4 = \frac{1}{3^4}$

$$\begin{aligned} 3^{-8} \div 3^{-4} \\ 3^{-8 - (-4)} \\ 3^{-8 + 4} \\ 3^{-4} = \frac{1}{3^4} = \frac{1}{81} \end{aligned}$$

5. Which expression is equivalent to the expression shown below?

$$-\frac{1}{2}\left(-\frac{3}{2}x + 6x + 1\right) - 3x \quad \leftarrow \text{Distribute } -\frac{1}{2} \text{ to each term inside } ()$$

A. $\frac{3}{2}x - \frac{1}{2}$

$$\frac{3}{4}x - 3x - \frac{1}{2} - 3x$$

B. $6\frac{3}{4}x - \frac{1}{2}$

$$\frac{3}{4}x - 3x - \frac{1}{2} - 3x$$

C. $-\frac{3}{4}x + \frac{1}{2}$

$$\left(\frac{3}{4}x - 6x\right) - \frac{1}{2} \quad (\text{see work})$$

D. $-5\frac{1}{4}x - \frac{1}{2}$

$$-\frac{21}{4}x - \frac{1}{2}$$

$$-5\frac{1}{4}x - \frac{1}{2}$$

$$\frac{3}{4}x - 6x$$

$$\frac{3}{4}x + (-6x)$$

$$\frac{3}{4}x + \frac{-24}{4}x$$

$$\frac{-21}{4}x$$

This problem can also be done with decimals. Work inside the () first.

$$-\frac{1}{2}(-1.5x + 6x + 1) - 3x$$

$$-\frac{1}{2}(4.5x + 1) - 3x$$

$$-2.25x - \frac{1}{2} - 3x$$

$$-2.25x + (-3x) - \frac{1}{2}$$

$$-5.25x - \frac{1}{2}$$

6. Ms. Gartland bought x number of shirts for the new members of her chorus. The cost for x number of shirts, including \$3.99 shipping was \$77.49. Each shirt cost \$12.25. There was no sales tax on this purchase. Which equation could be used to find x ?

A. $3.99(x + 12.25) = 77.49$

B. $3.99x + 12.25 = 77.49$

C. $12.25(x + 3.99) = 77.49$

D. $12.25x + 3.99 = 77.49$

Extended Response: Show all necessary work.

7. Which expressions are a factor of $-48xyz - 24xy + 40xyz$? Select all that apply.

A. 4

B. $3x$

C. $8y$

40 is not divisible by 3

D. $2xy$

E. $6xy$

F. xyz

40 is not divisible by 6

not every term has z

8. Factor the expression $18d^2 + 45d^6$ by factoring out the GCF.

GCF: $9d^2$

$$\frac{18d^2 + 45d^6}{9d^2} \quad \frac{2 + 5d^4}{1}$$

$$2 + 5d^4$$

Factored Form: $9d^2(2 + 5d^4)$

9. A number, n , is multiplied by $-\frac{5}{8}$ and the result is -0.4 . What is the value of n ?

$$-\frac{5}{8}n = -0.4$$

$$-\frac{5}{8}n = -\frac{4}{10}$$

$$-\frac{\cancel{8}}{\cancel{5}} \cdot \frac{\cancel{5}}{\cancel{8}}n = -\frac{4}{10} \cdot -\frac{\cancel{8}}{\cancel{5}}$$

$$n = -\frac{4}{10} \cdot -\frac{\cancel{8}}{\cancel{5}}$$

$$n = \frac{16}{25} \text{ or } 0.64$$

10. Find the value of the expression. $\frac{5}{(-1.5+9.5)} + \frac{0.4(7+11)}{-0.2}$

$$\frac{5}{(-1.5+9.5)} + \frac{0.4(7+11)}{-0.2}$$

$$\frac{5}{8} + \frac{7.2}{-0.2}$$

$$\frac{5}{8} + (-36)$$

$$0.625 + (-36)$$

$$-35.375 \text{ or } -35\frac{3}{8}$$

Step 1: $-1.5 + 9.5 = 8$

$$\begin{array}{r} 9.5 \\ -1.5 \\ \hline 8.0 \end{array}$$

Step 2: $0.4(7+11)$

$$\begin{array}{r} 0.4(18) \\ 7.2 \\ \times 4 \\ \hline 72 \end{array}$$

Step 3: Divide 7.2 by -0.2 $(+) \div (-) = (-)$

$$\begin{array}{r} 36 \\ 0.2 \overline{)7.2} = 2 \overline{)72} \\ -6 \downarrow \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

Step 4: $0.625 + (-36)$

$$\begin{array}{r} 5 \quad 9 \quad 9 \\ 36.000 \\ -0.625 \\ \hline 35.375 \end{array}$$