1. Given that $x < 0$, $y > 0$, and $z < 0$, which of the following values must be positive?

A. $\dfrac{x\ |xyz|}{y}$

B. $\dfrac{xy\ |x^2 + yz|}{z}$

C. $yz\ |y^2 z|$

D. $\dfrac{x^2 yz}{|z|}$

E. More than one is positive

2. Simplify.
$$(-2)^{-3} + 3^2$$

A. $\dfrac{73}{8}$

B. 15

C. 1

D. -1

E. $\dfrac{71}{8}$

3. Simplify.
$$\frac{\left(4x^{-5}y^2 z^0\right)\left(3x^3 y^4 z^{-7}\right)}{6z^{-5}}$$

A. $\dfrac{2y^6}{x^2 z^2}$

B. $\dfrac{2y^8}{x^{15} z^5}$

C. $\dfrac{2y^8}{x^{15}}$

D. $2x^2 y^6 z^2$

E. None of the above

4. Multiply and express as a polynomial.

$$(2x + 3)(x^2 - 4x + 1)$$

A. $2x^3 - 8x^2 + 2x + 3$

B. $2x^3 + 3x^2 - 8x + 2$

C. $2x^3 - 5x^2 - 10x + 3$

D. $2x^3 + 6x^2 - 10x + 2$

E. None of the above

5. Simplify.

$$\left(\frac{1}{5}a^{-3}b^4c\right)^{-3}$$

A. $-\dfrac{3a^9}{5b^{12}c^3}$

B. $\dfrac{125b}{a^6c^3}$

C. $-\dfrac{3b}{5a^6c^3}$

D. $\dfrac{125a^9}{b^{12}c^3}$

E. None of the above

6. Rationalize the denominator and simplify the result.

$$\sqrt{\frac{2x^2}{3xy^3}}$$

A. $\dfrac{\sqrt{6xy}}{3y^2}$

B. $\dfrac{2x}{3y^3}$

C. $\dfrac{\sqrt{2x}}{y}$

D. $\dfrac{4x^2}{9y^6}$

E. $\dfrac{\sqrt{2}}{3y^3}$

7. Which of the following is a factor of $12x^2 + 16x - 3$?

A. $3x + 1$

B. $12x - 1$

C. $2x - 3$

D. $4x + 3$

E. $6x - 1$

8. Which of the following is a factor of $81x^4 - 16y^8$?

A. $81x - 16y^2$

B. $3x^2 - 2y^4$

C. $81x^2 + 16y^4$

D. $3x + 2y^2$

E. $9x^2 + 8y^4$

9. Simplify.

$$\frac{(3x+1)^2}{x^2 - 7x + 12} \cdot \frac{9x^2 - 1}{x - 4}$$

A. $\dfrac{1}{x + 3}$

B. $\dfrac{3x + 1}{(x - 3)(3x - 1)}$

C. $\dfrac{3x + 1}{x - 3}$

D. $\dfrac{1}{x - 3}$

E. $\dfrac{3x - 1}{(x - 3)(3x + 1)}$

10. For what value of c is the number $x = 3$ a solution of:

$$4x - c(5 - 2x) = cx - 4$$

A. $c = -13$

B. $c = 8$

C. $c = 4$

D. $c = \dfrac{19}{3}$

E. None of the above

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11. Solve $\dfrac{1}{w} = \dfrac{1}{p} + \dfrac{1}{h}$ for w.

A. $w = \dfrac{ph}{2}$

B. $w = \dfrac{1}{2}$

C. $w = \dfrac{h + p}{ph}$

D. $w = \dfrac{ph}{h + p}$

E. $w = p + h$

12. Solve the following equation for x. Choose the answer that best describes the solution.
$$\frac{3}{2x - 1} = \frac{5}{x + 4}$$

A. x is between 1 and 2

B. x is between 2 and 3

C. x is between 3 and 4

D. There is no solution for x.

E. All real numbers are solutions

except $x = 0, -1$, and 1.

13. Simplify.
$$\frac{\dfrac{4x}{x - 3} - 2}{x - \dfrac{9}{x}}$$

A. $\dfrac{4x - 2}{(x + 3)(x - 3)}$

B. $\dfrac{2x}{(x - 3)^2}$

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

D. $\dfrac{2}{x - 3}$

E. $\dfrac{2x}{(x + 3)(x - 3)}$

14. A grocer wants to market a new blend of coffee by mixing Mocha beans with Brazilian beans. He is going to make 100 pounds of the blend and sell it for $3.90 per pound. The Mocha beans sell for $2.75 per pound and the Brazilian beans sell for $5.00 per pound. How many pounds of the Mocha beans should be used to create the blend? Round your answer to the nearest tenth of a pound.

   A. 34.7 pounds

   B. 48.9 pounds

   C. 50.3 pounds

   D. 78.0 pounds

   E. None of the above

15. A man goes to a car dealer to buy a used car. The car he is interested in is on sale for 5% off the sticker price. As he looks the car over, he notices a small dent near the bumper. The salesman offers to deduct another 20% off after the 5% reduction. The man pays $8500 for the car. If x represents the sticker price of the car, find the equation that would be used to find x.

   A. $0.76x = 8500$

   B. $0.25x = 8500$

   C. $1.26x = 8500$

   D. $1.25x = 8500$

   E. $0.75x = 8500$