

Answers

1. C 2. B 3. B 4. D 5. A 6. C 7. A 8. D 9. B 10. B

Answer Explanations:

1. **C.** In this problem, we are given two fractions and asked to find an equivalent expression to the difference between the two fractions. First, we must rewrite our fractions to have a common denominator.

$$\frac{3}{4x^2} - \frac{5}{6x^2} \rightarrow \frac{18}{24x^2} - \frac{20}{24x^2} \rightarrow -\frac{2}{24x^2} \rightarrow -\frac{1}{12x^2}, \text{ which makes answer choice (C) correct.}$$

2. **B.** In this problem, we are given the equation $\frac{x-y}{y} = \frac{4}{9}$ and asked to find an equivalent equation. Here, we can remove the fractions in our equation by cross multiplying.

$$\frac{x-y}{y} = \frac{4}{9} \rightarrow 9(x-y) = 4y \rightarrow 9x - 9y = 4y \rightarrow 9x = 13y \rightarrow \frac{x}{y} = \frac{13}{9}, \text{ which makes answer choice (B) correct.}$$

3. **B.** In this problem, we are given two fractions and asked to find an equivalent expression to the summation of the two expressions. Given that these two fractions have a common denominator we can simply add

them straightaway. $\frac{x+6}{6} + \frac{x-6}{6} \rightarrow \frac{(x+6)+(x-6)}{6} \rightarrow \frac{x+x}{6}$, which makes answer choice (B) correct.

4. **D.** In this problem, we are given the expression $5^2(15k) - 25$ and asked to find an equivalent expression. Here, we can use the order of Parenthesis Exponents Multiplication Division Addition Subtraction (PEMDAS) to best simplify our expression. $5^2(15k) - 25 \rightarrow 25(15k) - 25 \rightarrow 375k - 25$, which makes answer choice (D) correct.

5. **A.** In this problem, we are given the expression $(2j^2k)^4 + (\theta - 4)$ and asked to find an equivalent expression. $(2j^2k)^4 + (\theta - 4) \rightarrow (2^{1 \times 4} j^{2 \times 4} k^{1 \times 4}) + (\theta - 4) \rightarrow (16j^8k^4) + (\theta - 4)$, which makes answer choice (A) correct.

6. **C.** In this problem, we are given the expression $(3s^5t)^4 + (p-3)$ and asked to find an equivalent expression. $(3s^5t)^4 + (p-3) \rightarrow (3^{1 \times 4} s^{5 \times 4} t^{1 \times 4}) + (p-3) \rightarrow (81s^{20}t^4) + (p-3)$, which makes answer choice (C) correct.

7. **A.** In this problem, we are given the expression $\frac{1}{\frac{1}{x+2} + \frac{1}{x+4}}$ and asked to find an equivalent expression.

First, we must rewrite our fractions to have a common denominator.

$$\frac{1}{\frac{1}{x+2} + \frac{1}{x+4}} \rightarrow \frac{1}{\frac{(x+4)}{(x+4)(x+2)} + \frac{(x+2)}{(x+4)(x+2)}} \rightarrow \frac{1}{\frac{2x+6}{x^2+6x+8}} \rightarrow \frac{x^2+6x+8}{2x+6} \text{ which makes answer}$$

choice (A) correct.

8. **D.** In this problem, we are given the expression $\frac{(x^8 y^8 z^8)^2}{(x^9 y^9 z^9)^3}$ and asked to find an equivalent expression.

First, let's expand our expression. $\frac{(x^8 y^8 z^8)^2}{(x^9 y^9 z^9)^3} \rightarrow \frac{(x^{8 \times 2} y^{8 \times 2} z^{8 \times 2})}{(x^{9 \times 3} y^{9 \times 3} z^{9 \times 3})} \rightarrow \frac{x^{16} y^{16} z^{16}}{x^{27} y^{27} z^{27}}$. From this expansion we can determine that answer choice (D) is an equivalent expression.

9. **B.** In this problem, we are given the expression $(4^a)^2$ and asked to find an equivalent expression.

Remember, the following property of exponents" $(a^m)^n = a^{mn}$. We can use this property to determine the equivalent expression. $(4^a)^2 \rightarrow 4^{a \times 2} \rightarrow 4^{2a}$, which makes answer choice (B) correct.

10. **C.** In this problem, we are given the expression $3^x \times a^x = 27^x$ and asked to find an equivalent expression.

First, let's recall the following property of exponents: $a^x \times b^x = (ab)^x$. We can use this property of exponents to simplify the left-hand side $(3a)^x = 27^x$. Now because our left-hand side and right-hand side have equivalent exponents we can solve for a by setting their bases equal. $3a = 27 \rightarrow a = 9$, which makes answer choice (C) correct.