

Instructions: Show all work. Give exact answers (never decimals) unless specifically asked to round. If you use your calculator to get answers you must still convert the answers to fractions, and you risk losing all points if you show no work and the answer is incorrect.

1. Simplify the following expressions. Be sure to use correct order of operations.

$$a. \frac{3 \cdot 2^3 - 2^2 \cdot 12}{3 + 3^2} = \frac{3 \cdot 8 - 4 \cdot 12}{3 + 9} = \frac{24 - 48}{12} = \frac{-24}{12} =$$

$$\boxed{-2}$$

$$b. \left[\frac{9}{10} \div \left(\frac{2}{5} + \frac{1}{5} \right) + \frac{7}{2} \right] \cdot \frac{1}{10} = \left[\frac{9}{10} \div \left(\frac{3}{5} \right) + \frac{7}{2} \right] \cdot \frac{1}{10} =$$

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$$\left[\frac{9^3}{10^3} \cdot \frac{5^1}{3^1} + \frac{7}{2} \right] \cdot \frac{1}{10} = \left[\frac{3}{2} + \frac{7}{2} \right] \cdot \frac{1}{10} =$$

$$\left[\frac{10}{2} \right] \cdot \frac{1}{10} = \boxed{\frac{1}{2}}$$

2. Simplify the expression $\frac{1}{2}(4x - 2) - \frac{2}{3}(3x - 9)$.

$$\frac{4}{2}x - \frac{2}{2} - \frac{6}{3}x + \frac{2 \cdot 9^3}{3^1}$$

$$\cancel{2x} - 1 - \cancel{2x} + 6 = \boxed{5}$$

3. Evaluate the expression $\frac{9x - 5y^2}{x - y}$, for $x = 3, y = -3$.

$$\frac{9(3) - 5(-3)^2}{3 - (-3)} = \frac{9(3) - 5(9)}{3 - (-3)} = \frac{27 - 45}{3 - (-3)} = \frac{-18}{6}$$

$$= \boxed{-3}$$