

Questions

1. Multiply using the Distributive Property $\frac{5}{6}(12x^2 - 24x + 18)$.
2. Multiply using the Distributive Property $\frac{x}{5}(x + 10y - 4)$.
3. Multiply using the Distributive Property $(2x - 3)(-2)$.
4. Multiply using the Distributive Property $(6x + y - 1)(3x)$.
5. Multiply using the Distributive Property $(3x + 2y - 1)(-xy)$.
6. Multiply using the Distributive Property $\frac{1}{2}x\left(\frac{3}{5}x + \frac{4}{5}y - 5\right)$.
7. The price of a cell phone was $2x$. A manager's special reduced the price by \$5. If the store sold $4y$ cell phones, use the distributive property to find the value of the cell phones sold.
8. The Beverly Airport runway is $4x$ feet wide. The airport was supposed to have a 3000 ft long runway, however some of the land was too wet to build on so the length of the runway was decreased by $2y$ feet. Use the distributive property to find the area of the runway.

Solutions

1.

$$\begin{aligned} \frac{5}{6}(12x^2 - 24x + 18) &= \frac{5}{6} \cdot 12x^2 - \frac{5}{6} \cdot 24x + \frac{5}{6} \cdot 18 \text{ distributive property} \\ &= \frac{5 \cdot 12x^2}{6} - \frac{5 \cdot 24x}{6} + \frac{5 \cdot 18}{6} \text{ simplify} \\ &= \frac{5 \cdot \cancel{2} \cdot \cancel{6}x^2}{\cancel{6}} - \frac{5 \cdot \cancel{6} \cdot 4x}{\cancel{6}} + \frac{5 \cdot \cancel{6} \cdot 3}{\cancel{6}} \text{ simplify} \\ &= 10x^2 - 20x + 15 \text{ simplify} \end{aligned}$$

2.

$$\begin{aligned} \frac{x}{5}(x + 10y - 4) &= \frac{x}{5} \cdot x + \frac{x}{5} \cdot 10y - \frac{x}{5} \cdot 4 \\ &= \frac{x \cdot x}{5} + \frac{x \cdot 10y}{5} - \frac{x \cdot 4}{5} \\ &= \frac{x^2}{5} + \frac{2 \cdot \cancel{5}xy}{\cancel{5}} - \frac{4x}{5} \\ &= \frac{x^2}{5} + 2xy - \frac{4x}{5} \end{aligned}$$

3.

$$\begin{aligned} (2x - 3)(-2) &= 2x \cdot (-2) - 3 \cdot (-2) \\ &= -4x + 6 \end{aligned}$$

4.

$$\begin{aligned} (6x + y - 1)(3x) &= 6x \cdot (3x) + y \cdot (3x) - 1 \cdot (3x) \\ &= 18x^2 + 3xy - 3x \end{aligned}$$

5. Multiply using the Distributive Property $(3x + 2y - 1)(-xy)$.

$$\begin{aligned}(3x + 2y - 1)(-xy) &= 3x \cdot (-xy) + 2y \cdot (-xy) - 1 \cdot (-xy) \\ &= -3xy - 2xy^2 + xy\end{aligned}$$

6. Multiply using the Distributive Property .

$$\begin{aligned}\frac{1}{2}x \left(\frac{3}{5}x + \frac{4}{5}y - 5 \right) &= \frac{1}{2}x \cdot \frac{3}{5}x + \frac{1}{2}x \cdot \frac{4}{5}y - \frac{1}{2}x \cdot 5 \\ &= \frac{1 \cdot x \cdot 3 \cdot x}{2 \cdot 5} + \frac{1 \cdot x \cdot 4 \cdot y}{2 \cdot 5} - \frac{1 \cdot x \cdot 5}{2} \\ &= \frac{3x^2}{10} + \frac{4xy}{10} - \frac{5x}{2}\end{aligned}$$

7.

$$\begin{aligned}\text{value sold} &= (\text{number sold})(\text{original price} - \text{price reduction}) \\ &= (4y)(2x - 5) = (4y)(2x) - (4y)(5) = 8xy - 20y \text{ dollars}\end{aligned}$$

8.

$$\begin{aligned}\text{area} &= (\text{length})(\text{width}) \\ &= (4x)(3000 - 2y) = (4x)(3000) - (4x)(2y) = 12000x - 8xy \text{ ft}^2\end{aligned}$$