Questions

1. Evaluate $3x^2 - 5x$ when $x = -3$.

2. Evaluate $x^2 - 7x + 3$ when $x = 3$.

3. Evaluate $\dfrac{a^2 + ab}{3b}$ when $a = -1$ and $b = -2$.

4. A park has a triangular piece of land on the border. The altitude of the triangle is 400 ft. The base of the triangle is 280 ft. What is the area of this piece of land?

5. The radius of a circular opening on a chemistry flask is 4cm. What is the area of the opening?

6. Find the total cost of making a triangular sail that has a base dimension of 12 ft and a height of 20 ft if the price of making the sail is \$19.50 per square ft.

7. Dry ice is sold as carbon dioxide. Dry ice does not melt, it goes directly from solid state to gaseous state. Dry ice changes from a solid to a gas at $-109.3°$F. What is this temperature in Celsius?

Solutions

1. Write the equation using brackets where there are xs:

$$\begin{aligned}\text{value} &= 3(\quad)^2 - 5(\quad) \\ &= 3(-3)^2 - 5(-3) \text{ put } -3 \text{ in the brackets} \\ &= 3(9) + 15 \text{ simplify} \\ &= 27 + 15 = 42\end{aligned}$$

2. Evaluate $x^2 - 7x + 3$ when $x = 3$.

$$\begin{aligned}\text{value} &= (\quad)^2 - 7(\quad) + 3 \\ &= (3)^2 - 7(3) + 3 \\ &= 9 - 21 + 3 = -9\end{aligned}$$

3. If you have trouble doing two variables, do it in two steps.

$$\begin{aligned}\text{value} &= \frac{(\quad)^2 + (\quad)b}{3b} \text{ do } a \text{ first} \\ &= \frac{(-1)^2 + (-1)b}{3b} \text{ put in } a = -1 \\ &= \frac{1 - b}{3b} \text{ simplify} \\ &= \frac{1 - (\quad)}{3(\quad)} \text{ now do } b \\ &= \frac{1 - (-2)}{3(-2)} \text{ put in } b = -2 \\ &= -\frac{3}{3(2)} \text{ simplify} \\ &= -\frac{\cancel{3}}{\cancel{3}(2)} \text{ simplify} \\ &= -\frac{1}{2}\end{aligned}$$

4. Include the units.

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2}(\text{base})(\text{perpendicular height})\\ &= \frac{1}{2}(280\text{ft})(400\text{ft})\\ &= 56000\text{ft}^2\end{aligned}$$

5.

$$\begin{aligned}\text{Area of Circle} &= \pi(\text{radius})^2\\ &= \pi(4\text{cm})^2\\ &= \pi(16\text{cm}^2)\\ &= 16\pi\text{cm}^2 \sim 50.2\text{cm}^2\end{aligned}$$

6. First, find the area of the sail.

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2}(\text{base})(\text{perpendicular height})\\ &= \frac{1}{2}(12\text{ft})(20\text{ft})\\ &= 120\text{ft}^2\\ \text{Total Cost} &= (\text{area})(\text{cost per square ft})\\ &= (120\cancel{\text{ft}^2})(\$19.50\frac{1}{\cancel{\text{ft}^2}})\\ &= \$2340\end{aligned}$$

7.

$$\begin{aligned}T_C &= \frac{5}{9}\left(T_F - 32\right)\\ &= \frac{5}{9}\left(-109.3 - 32\right)\\ &= -78.5^\circ\text{C}\end{aligned}$$