Name: _____   Date: _____

| **Learning Goal 6.1** | Simplifying and applying operations to rational expressions, identifying any non-permissible values. |

Simplify each rational expressions and state the non-permissible values.

a. $\dfrac{-25a^3b^2c}{35ab^5}$ Non-permissible values:
$$a, b \neq 0$$

$$= \frac{-5a^3b^2c}{7ab^5}$$
$$= \frac{-5a^2b^2c}{7b^5}$$
$$= \frac{-5a^2c}{7b^3}$$

b. $\dfrac{6 - 2m}{m^2 - 9}$ Non-permissible values:
$$m^2 - 9 \neq 0$$
$$m^2 \neq 9$$
$$m \neq \pm 3$$

$$= \frac{2(3 - m)}{m^2 - 9}$$
$$= \frac{2(3 - m)}{(m + 3)(m - 3)}$$
$$= \frac{-2(m - 3)}{(m + 3)(m - 3)}$$
$$= \frac{-2}{(m + 3)}$$

c. $\dfrac{6x^2 + 12x}{3x}$ Non-permissible values:
$$x \neq 0$$

$$= \frac{6x(x + 2)}{3x}$$
$$= \frac{2x(x + 2)}{x}$$
$$= 2(x + 2)$$

d. $\dfrac{x^2 - 49}{x^2 - 5x - 14}$ Non-permissible values:
$$x^2 - 5x - 14 \neq 0$$
$$(x - 7)(x + 2) \neq 0$$
$$x \neq -2, 7$$

$$= \frac{(x + 7)(x - 7)}{x^2 - 5x - 14}$$
$$= \frac{(x + 7)(x - 7)}{(x - 7)(x + 2)}$$
$$= \frac{(x + 7)}{(x + 2)}$$

e. $\dfrac{2x^2 - 5x - 3}{9 - x^2}$ Non-permissible values:

$$9 - x^2 \neq 0$$
$$9 \neq x^2$$
$$x \neq \pm 3$$

$$= \frac{(x - 3)(2x + 1)}{9 - x^2}$$
$$= \frac{(x - 3)(2x + 1)}{(3 + x)(3 - x)}$$
$$= \frac{(x - 3)(2x + 1)}{-(3 + x)(x - 3)}$$
$$= -\frac{(2x + 1)}{(3 + x)}$$

f. $\dfrac{x^2 + 6x + 8}{x^2 - 4}$ Non-permissible values:

$$x^2 - 4 \neq 0$$
$$x^2 \neq 4$$
$$x \neq \pm 2$$

$$= \frac{(x + 4)(x + 2)}{x^2 - 4}$$
$$= \frac{(x + 4)(x + 2)}{(x + 2)(x - 2)}$$
$$= \frac{(x + 4)}{(x - 2)}$$