RATIONAL EXPRESSIONS   **PROBLEMS**

1. What are the non-permissible values:

$$\frac{1}{x^2 - 2x - 35}$$

2. What are the non-permissible values:

$$\frac{7x}{1 + 2x^2}$$

3. It is 18 meters from Pi's bed to the kitchen. She typically goes quite slowly, but when she hears the treat container open she can get to the kitchen 4 seconds faster than usual.

   Remember: $Distance\ travelled = speed\ \times time$

a) Write two rational expressions, one for Pi's typical speed and distance and one for her speed and distance when she hears the treat container open. Hint: The expressions will have time as a variable.

b) What are restrictions on the variable 't' (time) for each expression and why?

4. Simplify:

$$\frac{9x^2}{x^2(3x^2 - 27)}$$

5. Multiply:

$$\frac{3x + 3}{15x^2 - 5x} \times \frac{3x - 1}{x^2 - 1}$$

6. Multiply: (treat 'x' as a variable and 'y' as a constant)

$$\frac{4x^2 + 4xy}{2} \times \frac{x - y}{(x^2 - y^2)}$$

7. Divide:

$$\frac{7x + 7}{x - 5} \div \frac{5}{x^2 + 2x - 35}$$

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8. Divide:

$$\frac{9x^2 + 18x + 9}{x + 1} \div \frac{3x}{x - 6}$$

9. Add:

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

10. Add:

$$\frac{3z}{5z + 15} + \frac{z}{z + 3}$$

11. Subtract:

$$\frac{x}{x^2 - 9} - \frac{3}{x + 3}$$

12. Subtract:

$$\frac{3x + 2}{x - 1} - \frac{2x - 2}{2x - 1}$$

13. Solve:

$$\frac{2}{4 - m} = 3$$

14. Solve:

$$\frac{5x}{10 - 5x} + \frac{3}{x - 2} = 2$$