Part A: Rational Algebraic Expressions [A-SSE.1, A-SSE.2]

1. **Simplify** the expressions by multiplying, adding, or subtracting. **Show** your work.

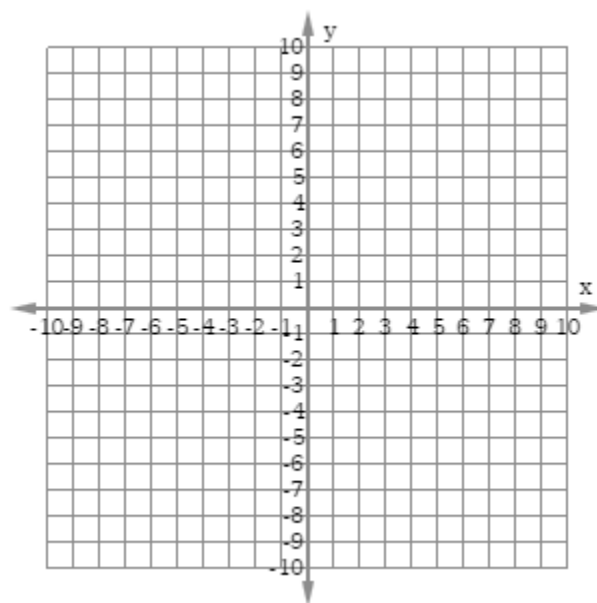| A) $\dfrac{3}{x+4} \bullet \dfrac{2x+1}{x-3}$	B) $\dfrac{5}{x+2} + \dfrac{x}{x-4}$	C) $\dfrac{x}{x-3} - \dfrac{x+1}{x+5}$

Part B: Rational Algebraic Functions [F-IF.4, F-BF.3]

2. **Graph** the function. **Identify** the intercept(s), asymptote(s), and end behavior.

$$f(x) = \frac{7}{x+3}$$

A) Intercept(s): _____

B) Asymptote(s): _____

C) End Behavior: _____

Part C: Rational Algebraic Equations [A-CED.2, A-REI.2]

3. **Determine** the value of x that makes the equation true. **Show** your work and **justify** your steps.

A) $\dfrac{16}{4} = \dfrac{12}{x}$	B) $\dfrac{x+4}{12} = \dfrac{6}{8}$	C) $\dfrac{12}{2x-4} = \dfrac{3}{x-2} + 3$

4. Vanessa solved the equation. **Identify** and **explain** the first error Vanessa made, then **correct** her their work.

$$\frac{x}{x+2} = \frac{3x-2}{x+6}$$

Step 1: $x(x+6) = (x+2)(3x-2)$

Step 2: $x^2 + 6x = 3x^2 + 4x - 4$

Step 3: $6x = 2x^2 + 4x - 4$

Step 4: $0 = 2x^2 + 2x - 4$

Step 5: $0 = 2(x^2 + x - 2)$

Step 6: $0 = 2(x+2)(x-1)$

Step 7: $x = -2, x = 1$