1.
$$\frac{3x}{8x^4 - 128x^2} - \frac{7}{12x^3 - 42x^2 - 24x}$$

$$8x^2(x^2-16) \qquad 6x(2x^2-7x-4)$$
$$8x^2(x-4)(x+4) \qquad 6x(2x+1)(x-4)$$

$$\frac{3(2x+1)}{3(2x+1)}\frac{3x}{8x^2(x-4)(x+4)} \qquad - \frac{7}{6x(2x+1)(x-4)} \cdot \frac{4x(x+4)}{4x(x+4)}$$

$$9x(2x+1) \quad - \quad 28x(x+4)$$
$$18x^2 + 9x - 28x^2 - 112x$$
$$\overline{\qquad\qquad 24x^2(x\pm4)(2x+1)\qquad\qquad}$$

$$= \frac{-10x^2 - 103x}{24x^2(x\pm4)(2x+1)}$$

2.
$$\frac{8}{2x^2 + 8x + 6} + \frac{6}{4x^3 - 4x^2 - 8x} - \frac{5x}{x^3 + x^2 - 6x}$$

$$2(x^2+4x+3) \qquad 4x(x^2-x-2) \qquad x(x^2+x-6)$$
$$2(x+3)(x+1) \qquad 4x(x-2)(x+1) \qquad x(x+3)(x-2)$$

$$\frac{2x(x-2)}{2x(x-2)}\frac{8}{2(x+3)(x+1)} + \frac{6\,(x+3)}{4x(x-2)(x+1)(x+3)} - \frac{5x}{x(x+3)(x-2)} \cdot \frac{4(x+1)}{4(x+1)}$$

$$= \frac{16x^2 - 32x + 6x + 18 - 20x^2 - 20x}{4x(x+1)(x+3)(x-2)}$$

$$= \frac{-4x^2 - 46x + 18}{4x(x+1)(x+3)(x-2)}$$

3. If the product of $(1 + 2), (2 + 3)$, and $(3 + 4)$ is equal to $\frac{1}{2}$ the sum of 20 and x, what is the value of x ?

A. 10   B. 85   C. 105   D. 190   E. 1210

$(3)(5)(7) = \frac{1}{2}(20 + x)$

$2 \cdot 105 = \frac{1}{2}(20 + x) \cdot 2$

$210 = 20 + x$

$x = 190$

4. At Ernie's Fruit Stand, 3 apples and 5 cherries cost $1.25. 15 apples and 100 cherries cost $9.25. What is the cost of 6 apples and 35 cherries?

A. $3.25

B. $3.50

C. $3.62

D. $4.00

E. $5.25

$5\left(\begin{array}{c} 3A + 5C = 1.25 \\ 15A + 100C = 9.25 \end{array} \right)$

$\overline{15A + 25C = 6.25}$
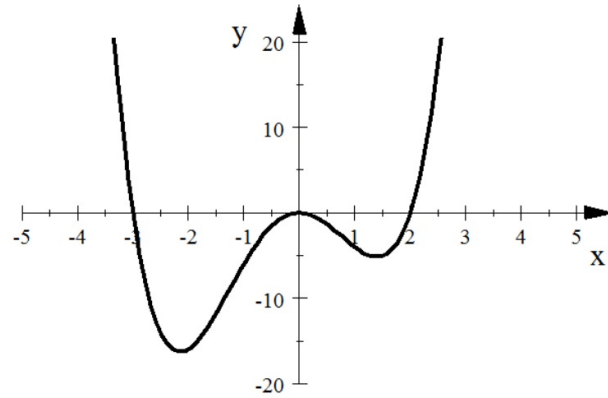
$75C = 3.00$

$C = 0.04$

$3A + 5(.04) = 1.25$

$A = 0.35$

5. Which of the following could be an equation for the graph shown below?

A) $y = x(x+3)^2(x-2)$

B) $y = x(x+2)^2(x-3)$

C) $y = x^2(x+3)(x-2)$

D) $y = x^2(x+2)(x-3)$

Sec 9-5: Adding and Subtracting Rational Expressions.

Simplify. $\dfrac{3}{4x^3 - 16x^2 - 20x} + \dfrac{7}{6x^2 - 150}$

Simplify. $\dfrac{8}{x-3} - \dfrac{4}{x^2+2x-15} + \dfrac{3}{x+5}$

$\dfrac{(x+5)}{(x+5)}\dfrac{8}{x-3} - \dfrac{4}{(x+5)(x-3)} + \dfrac{3}{x+5}\dfrac{(x-3)}{(x-3)}$

$= \dfrac{8x+40-4+3x-9}{(x+5)(x-3)}$

$= \dfrac{11x+27}{(x+5)(x-3)}$

Simplify without using a calculator. Leave your answer
as an improper fraction in reduced form.

$$\frac{3\left(\dfrac{7}{3} - 4\right)}{3\left(5 + \dfrac{2}{3}\right)} = \frac{7 - 12}{15 + 2} = -\frac{5}{17}$$

Complex Fractions: (also known as Compound Fractions)
Fractions whose numerators and/or
denominators also have fractions.

Simplify:

$$\frac{3 + \dfrac{4}{3}}{\dfrac{11}{6} - 1}$$

There are many methods to do this, I'll focus on two methods.

$$\frac{6\left(3 + \dfrac{4}{3}\right)}{6\left(\dfrac{11}{6} - 1\right)}$$

$$= \frac{18 + 8}{11 - 6} = \frac{26}{5}$$

One method:
Find LCM of all the denominators in the complex fraction.
Then multiply the numerator and denominator of the complex fraction by this LCM.

$$\frac{6}{6} \cdot \frac{\dfrac{3}{1} + \dfrac{4}{3} \cdot \dfrac{2}{2}}{\dfrac{11}{6} - 1 \cdot \dfrac{6}{6}}$$

Get ALL the "parts" of the complex fraction to have the LCD.

Then you can cancel all of the denominators.

Simplify:

$$\frac{24\left(\dfrac{2}{3} - \dfrac{7}{8}\right)}{24\left(\dfrac{3}{4} + \dfrac{5}{6}\right)} = \frac{16 - 21}{18 + 20}$$

$$= \frac{-5}{38}$$

Simplify: $x^2y^3\left(\dfrac{\frac{2}{x} + \frac{5}{y^3}}{\frac{3}{x^2} - \frac{6}{y^2}}\right) = \dfrac{2xy^3 + 5x^2}{3y^3 - 6x^2y}$

Simplify: $x^2y^2\left(\dfrac{\frac{10}{x} + \frac{4}{xy}}{\frac{2}{x^2y} - \frac{3}{xy^2}}\right) = \dfrac{10xy^2 + 4xy}{2y - 3x}$

Simplify:

$$\frac{x-5\left(6+\dfrac{2}{x-5}\right)}{x-5\left(\dfrac{1}{x-5}-8\right)}$$

$$=\frac{6x-30+2}{1-8x+40}=\frac{6x-28}{-8x+41}$$

Simplify:

$$\frac{\dfrac{3}{x+2}}{\dfrac{1}{x+5}+\dfrac{10x}{x^2+7x+10}}$$

Simplify:

$$\dfrac{\dfrac{4x}{x^2+8x+7}}{\dfrac{5x}{x^2+6x-7}+\dfrac{6}{x^2-1}}$$

Hwk #10:

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Problems 26, 28, 44, 46, 47, 48