

RATIONAL FUNCTIONS REVIEW

Simplify
1-3)

$\times + \div$ (2 problems)

factor + cancel

4-6) $+ + -$ (1 problem)

$$\frac{x+2}{x^2-2x+3} + \frac{4}{x^2-4}$$

1) factor denoms

2) Make & keep common denoms

7-8) Complex fractions (1 problem)

$$\frac{\frac{2}{x+3} + \frac{4}{x-5}}{\frac{1}{x} - \frac{2}{x+3}}$$

1) Make c.d. for top

↓ add to make one fraction

2) Bottom fractions - Do same

3) Keep-Change-flip

4) factor + cancel

Solve.

9-12) 2 problems

1) Factor denoms

2) Multiply by c.d. to cancel all denoms.

13-14) D/R/T Problems (1 problem)

15) 3 graphs

Factoring

$$\begin{aligned}
 &2x^2 - 50 \\
 &= 2(x^2 - 25) \\
 &= 2(x+5)(x-5)
 \end{aligned}$$

$$\begin{aligned}
 &x^3 - 27 \\
 &= (x-3)(x^2+3x+9)
 \end{aligned}$$

Grouping - 4 terms

$$\begin{aligned}
 &(2x^3 + 16x^2 - 5x - 40) \\
 &1) \underline{2x^2(x+8)} - 5(\underline{x+8}) \\
 &2) (x+8)(2x^2-5)
 \end{aligned}$$

Simplify

$$\frac{m^2 + n^2}{m^2 - n^2} + \frac{m}{n - m} + \frac{n}{m + n}$$

$$\frac{m^2 + n^2}{(m+n)(m-n)} + \frac{-m(m+n)}{+(m-n)(m+n)} + \frac{n(m-n)}{m+n(m-n)}$$

$$\frac{\cancel{m^2} + \cancel{n^2} - \cancel{m^2} - \cancel{mn} + \cancel{mn} - \cancel{n^2}}{(m+n)(m-n)}$$

$$= \frac{0}{(m+n)(m-n)}$$

$$= 0$$

$$\frac{x^3 + 3x^2 - 4x - 12}{x^3 + 27} \div \frac{2x - x^2}{2x^2 - 6x + 18}$$

$$\frac{x^2(x+3) - 4(x+3)}{x^3 + 27} \cdot \frac{2(x^2 - 3x + 9)}{2x^2 - 6x + 18}$$

$$\frac{x^3 + 3x^2 - 4x - 12}{x^3 + 27} \cdot \frac{2x - x^2}{2x^2 - 6x + 18}$$

$$\frac{\cancel{(x+3)} \overset{(x+2)(x-2)}{\cancel{(x^2-4)}}}{\cancel{(x+3)} \cancel{(x^2-3x+9)}} \cdot \frac{2 \cancel{(x^2-3x+9)}}{-x \cancel{(x-2)}}$$

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