# $9^{th}$ Grade Assignment – Week #35

Group Assignment:

*For Tuesday*

- *Challenge!* Given the equation $10x^3 - 7x^2 - 29x + 6 = 0$
  (1) Which of the following is a solution to the equation? x = -1, 10, 0, or 2?
  (2) Determine the other two solutions? (Hint: they are rational, but not integers.)
  I will go over this problem in Lecture #2 (Wednesday).
- If you have extra time, begin work on **Fractions & Square Roots – Problem Sets #8 - #10.**

*For Thursday*

- Pick and choose which problems to work on from
  **Fractions & Square Roots – Problem Sets #8 - #10.**

Individual Work

- As much as possible, do the problems from **Fractions & Square Roots – Problem Sets #8 - #10** that either weren't assigned for group work, or that your group didn't complete.

# Problem Set #8

## Group Work

**Divide.**

1) $\frac{x^3-x^2-11x+15}{x-3}$

2) $\frac{6x^3+x^2-10x+3}{2x+3}$

## Homework

**Simplify.**

3) $(5\sqrt{10})^2$

4) $\frac{3\sqrt{2}}{4\sqrt{3}}$

5) $(1+\sqrt{5})^2$

6) $(2\sqrt{3}-3\sqrt{5})^2$

7) $\left(\frac{2\sqrt{5}}{3}\right)^{-2}$

8) $\frac{3}{2+\sqrt{6}}$

9) $\frac{3+\sqrt{7}}{2-\sqrt{7}}$

10) $\frac{x^2+5x-6}{1-x^2}$

11) $\frac{x^2-5x-6}{1-x^2}$

12) $\frac{3x}{5y^4}+\frac{4}{3x^2y^2}$

13) $4y^{-2}-3xy^{-3}$

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

15) $\frac{x}{x-\frac{x}{1-\frac{1}{x}}}$

**Divide.**

16) $\frac{x^3+11x^2+32x+12}{x+6}$

17) $\frac{6x^3-5x^2-19x+20}{3x-4}$

18) $\frac{6x^3-5x^2-19x+20}{2x^2+x-5}$

**Solve.**

19) $\frac{1}{x-3}+\frac{1}{x+5}=\frac{x+1}{x-3}$

20) $\frac{1}{2}x^2-\frac{1}{3}x=2x+4$

21) $\frac{5x^2+6}{x^2-4}-\frac{3}{x-2}=\frac{5x+3}{x+2}$

22) The sum of the squares of three consecutive even integers is 200. Find the numbers.

23) The sum of Tim and Wendy's ages is 30. Three years ago, Tim was three times as old as Wendy. How old is Wendy now?

# Problem Set #9

## Group Work

Since $(x+2)(x–5)(x–4)$ multiplies out to become $x^3–7x^2+2x+40$, we can imagine that there would be some way to factor $x^3–7x^2+2x+40$ to become $(x+2)(x–5)(x–4)$. But how? See if you can figure out a way to factor the following problem into three binomials. (Hint: Use long division.)

1) $x^3+7x^2+7x–15$

## Homework

**Simplify.**

2) $\frac{8}{3\sqrt{7}}$

3) $\frac{8}{3+\sqrt{7}}$

4) $\frac{7\sqrt{6}}{\sqrt{3}}$

5) $\frac{2-\sqrt{3}}{4-\sqrt{3}}$

6) $(5–2\sqrt{3})^2$

7) $\left(\frac{5\sqrt{3}}{3}\right)^{-1}$

8) $\sqrt{45}-\sqrt{500}$

9) $\frac{3x}{4y^3}-\frac{1}{6x^2y}$

10) $3x^{-2}+5xy^{-3}$

11) $\frac{7}{5x+15}-\frac{1}{4x^2+12x}$

12) $\frac{x^2–6x+11}{6x–x^2–11}$

13) $\frac{x^2+6x–11}{x^2+11–6x}$

14) $\frac{\frac{72x^3–2x^5}{x^2+x–30}}{\frac{6x^2–36x}{x^2–3x–10}}$

15) $\frac{1-\frac{4}{x^2}}{\frac{x}{2}+1}$

**Divide.**

16) $\frac{2x^4–6x^3–19x^2+23x–6}{x^2–5x+2}$

17) $\frac{18x^3–17x+6}{3x–2}$

**Find the common solution.**

18) $6x + 4y = 1$
$3x – 8y = 8$

**Factor.**

19) $6x^3–49x^2+98x–15$
given $(x–5)$ is a factor.

20) $10x^3+19x^2–39x–18$
given $(5x+2)$ is a factor.

**Solve.**

21) $\frac{x}{x+1}=\frac{x+1}{x–4}+\frac{5}{x^2–3x–4}$

22) $\frac{3x}{2x+2}-\frac{5}{8}=\frac{3x^2}{x^2–1}-\frac{23}{4x–4}$

23) The sum of two numbers is 17. The sum of their squares is 91 more than their product. Find the two numbers.

# Problem Set #10

**Simplify.**

1) $\sqrt{363}$

2) $\sqrt{3^6 \cdot 5^5}$

3) $\sqrt{128} + \sqrt{12} - \sqrt{18}$

4) $\frac{7}{\sqrt{2}}$

5) $\frac{3-\sqrt{5}}{\sqrt{5}}$

6) $\frac{6-2\sqrt{2}}{4+3\sqrt{2}}$

7) $\frac{15x^2}{5x^5}$

8) $\frac{8x^4y^2 - 6x^3y^3}{2xy^2}$

9) $\frac{4x^2 + 5x - 6}{4 - x^2}$

10) $\frac{3}{4x^2y} + \frac{5}{6xy^3}$

11) $\frac{5}{x-7} - \frac{x+3}{7-x}$

12) $\frac{\frac{25}{x} - x}{2x^2 - 5x} - 3$

13) $\frac{\frac{1}{2x-2} - \frac{1}{x}}{\frac{2}{x} - \frac{1}{x-1}}$

**Find the Reciprocal.**

14) $\sqrt{11}$

15) $\frac{\sqrt{5}}{5}$

**Divide.**

16) $\frac{8x^3-24x^2-2x+30}{2x^2-3x-5}$

17) $\frac{8x^3 - 27}{2x - 3}$

**Give two solutions to:**

18) $3x - 4y = 24$

**Find the common solution.**

19) $7x - 6y = 15$
$3x - 8y = 20$

**Factor**.

20) $x^3 + 20x^2 - 4x - 80$
given (x+20) is a factor.

21) $2x^3 - 14x + 12$
given (x–1) is a factor.

22) $x^4 + 3x^3 - 12x - 16$
given $(x^2 - 4)$ is a factor.

23) **Solve.** $\frac{x+2}{x-1} - \frac{4-x}{2x} = \frac{7}{3}$

24) Jeff leaves home at 8:50am on his bike. At 9:10am, Dan leaves the same house on his moped to catch Jeff. At what time does Dan catch up to Jeff if Dan's speed is 50% greater than Jeff's?

25) A pile of 100 coins, worth $8.36, consists of pennies, nickels, dimes and quarters. There are five times as many nickels as pennies, and nine more dimes than pennies. How many of each kind of coin are there?