

**Thursday: Career of the Week**  
**Real Estate Agent**

**Career Name:** \_\_\_\_\_

**What do schooling do you need for this job?**

**What is the average salary?**

**Do you need to live a certain region of the country?**

**How competitive is this career?**

## Answers to Assignment (ID: 1)

1)  $a^2 + 8a - 6 - \frac{6}{6a - 5}$

4)  $x^2 + 2x + 9 - \frac{1}{4x + 1}$

7)  $p^2 + 6p - 6 - \frac{8}{p + 9}$

10)  $x^3 + 7x^2 + 2x - 9 + \frac{7}{x + 2}$

2)  $6a^2 + 8a - 1 + \frac{7}{2a - 1}$

5)  $x^2 - 6x - 8 + \frac{5}{9x + 1}$

8)  $x^2 - 8x + 1 + \frac{10}{x + 2}$

3)  $4n^2 + n - 4 - \frac{1}{3n - 1}$

6)  $a^2 - 3a - 4 - \frac{2}{a + 5}$

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

# Synthetic Division

How to synthetically divide:

When to use: only use when divisor is a linear binomial with a leading coefficient of 1

bottom term (what you're dividing by)

Steps:

1. Check polynomial for missing terms  
 Not missing ( $3x^2 + 2x + 5$ )  
 missing ( $10x^3 + 9$ )  $\rightarrow 10x^3 + 0x^2 + 0x + 9$
2. Write all coefficients without variables
3. Take divisor = 0; solve
4. Set up problem/bring down 1<sup>st</sup> term  
 solved divisor | coefficients  
 ↓  
 \_\_\_\_\_
5. Box # mult. by # below then to next coefficient (Repeat until done).
6. Write result with variables.

## Example 1

$$(8x^3 - 54x^2 + 44x - 45) \div (x - 6)$$

$$x - 6 = 0$$

$$x = 6$$

$$\begin{array}{r|rrrr} 6 & 8 & -54 & 44 & -45 \\ & \downarrow & 48 & -36 & 48 \\ \hline & 8x^2 & -6x & 8 & 3 \end{array} \leftarrow \text{remainder}$$

$$\text{answer: } 8x^2 - 6x + 8 + \frac{3}{x-6}$$

## Example 2

$$(x^4 - 13x^3 + 36x^2 + 35x + 49) \div (x - 7)$$

$$x - 7 = 0$$

$$x = 7$$

$$\begin{array}{r|rrrrr} 7 & 1 & -13 & 36 & 35 & 49 \\ & \downarrow & 7 & -42 & -42 & -49 \\ \hline & 1 & -6 & -6 & -7 & 0 \end{array} \leftarrow \text{NO remainder}$$

$$x^3 - 6x^2 - 6x - 7$$

Example 3

$$(x^4 - x^3 - 88x^2 + 16x - 21) \div (x + 9)$$

$$\begin{array}{r|rrrrr} -9 & 1 & -1 & -88 & 16 & -21 \\ & \downarrow & -9 & 90 & -18 & +18 \\ \hline & 1 & -10 & 2 & -2 & -3 \end{array}$$

$$\begin{array}{l} x+9=0 \\ -9 \quad -9 \\ \hline x=-9 \end{array}$$

Example 4

$$(x^3 + x^2 - 14x + 30) \div (x + 5)$$

$$\begin{array}{r|rrrr} -5 & 1 & 1 & -14 & 30 \\ & \downarrow & -5 & 20 & -30 \\ \hline & 1 & -4 & +6 & 0 \end{array}$$

$$x^2 - 4x + 6$$

$$(-9)^4 - (-9)^3 - 88(-9)^2 + 16(-9) - 21$$

$$(4x^4 - 10x^2 - 25) \div (x+2)$$

$4x^3$                        $0x$

$$\begin{array}{r|rrrrr} -2 & 4 & 0 & -10 & 0 & -25 \\ & \downarrow & -8 & 16 & -12 & 24 \\ \hline & 4x^3 & -8x^2 & 6x & -12 & -1 \end{array}$$

$$\boxed{A} - 8x^2 \quad \boxed{H} - 12 - \frac{1}{x+2}$$

$$A = 4x^3 \quad H = 6x$$