Summer School: Alg 2 Week 4 Day 4 Name Key ID: 1

Dividing Polynomials Using Synthetic Division

Divide.

1) $(r^3 + 6r^2 - 21r - 18) \div (r - 3)$

$$\begin{array}{r|rrrr} 3 & 1 & 6 & -21 & -18 \\ + & \downarrow & 3 & 27 & 18 \\ \hline & 1 & 9 & 6 & \lfloor 0 \end{array}$$

$\boxed{r^2 + 9r + 6}$

2) $(x^3 - 11x^2 + 22x + 40) \div (x - 5)$

$$\begin{array}{r|rrrr} 5 & 1 & -11 & 22 & 40 \\ & \downarrow & 5 & -30 & -40 \\ \hline & 1 & -6 & -8 & \lfloor 0 \end{array}$$

$\boxed{x^2 - 6x - 8}$

3) $(9x^3 - 19x^2 - 28x + 12) \div (x - 3)$

$$\begin{array}{r|rrrr} 3 & 9 & -19 & -28 & 12 \\ & \downarrow & 27 & 24 & -12 \\ \hline & 9 & 8 & -4 & \lfloor 0 \end{array}$$

$\boxed{9x^2 + 8x - 4}$

4) $(m^3 - 13m^2 + 24m + 18) \div (m - 3)$

$$\begin{array}{r|rrrr} 3 & 1 & -13 & 24 & 18 \\ & \downarrow & 3 & -30 & 18 \\ \hline & 1 & -10 & -6 & \lfloor 0 \end{array}$$

$\boxed{m^2 - 10m - 6}$

5) $(x^3 + 15x^2 + 45x - 25) \div (x + 5)$

$$\begin{array}{r|rrrr} -5 & 1 & 15 & 45 & -25 \\ & \downarrow & -5 & -50 & 25 \\ \hline & 1 & 10 & -5 & \lfloor 0 \end{array}$$

$\boxed{x^2 + 10x - 5}$

6) $(a^3 + 5a^2 + 14a + 16) \div (a + 2)$

$$\begin{array}{r|rrrr} -2 & 1 & 5 & 14 & 16 \\ & \downarrow & -2 & -6 & -16 \\ \hline & 1 & 3 & 8 & \lfloor 0 \end{array}$$

$\boxed{a^2 + 3a + 8}$

7) $(2x^3 + 9x^2 + 2x - 21) \div (x + 3)$

-3	2	9	2	-21
	↓	-6	-9	21
	2	3	-7	0

$\boxed{2x^2+3x-7}$

8) $(10r^3 - 22r^2 - 17r - 21) \div (r - 3)$

3	10	-22	-17	-21
	↓	30	24	21
	10	8	7	0

$\boxed{10r^2+8r+7}$

9) $(n^3 + 6n^2 + 4n - 2) \div (n + 1)$

-1	1	6	4	-2
	↓	-1	-5	1
	1	5	-1	-1

$\boxed{n^2+5n-1-\frac{1}{n+1}}$

10) $(7m^3 + 16m^2 - 7m + 27) \div (m + 3)$

-3	7	16	-7	27
	↓	-21	15	-24
	7	-5	8	3

$\boxed{7m^2-5m+8+\frac{3}{m+3}}$

11) $(5x^3 - 2x^2 + 5x - 16) \div (x - 1)$

1	5	-2	5	-16
	↓	5	3	8
	5	3	8	-8

$\boxed{5x^2+3x+8+\frac{-8}{x-1}}$

12) $(r^3 - 5r^2 - 3r + 26) \div (r - 4)$

4	1	-5	-3	26
	↓	4	-4	-28
	1	-1	-7	-2

$\boxed{r^2-r-7+\frac{-2}{r-4}}$

13) $(b^3 + 2b^2 - 15b + 49) \div (b + 6)$

-6	1	2	-15	49
	↓	-6	24	-54
	1	-4	9	-5

$\boxed{b^2-4b+9+\frac{-5}{b+6}}$

14) $(n^3 + 13n^2 + 40n + 26) \div (n + 9)$

-9	1	13	40	26
	↓	-9	-36	-36
	1	4	4	-10

$\boxed{n^2+4n+4+\frac{-10}{n+9}}$