# Dividing Polynomials with Long Division

Name: Key

Date:

**Divide.**

1) $(k^3 - 8k^2 + 16k - 5) \div (k - 5)$

$$\begin{array}{r|l} & \boxed{k^2 - 3k + 1} \\ \hline k-5 & k^3 - 8k^2 + 16k - 5 \\ & -k^3 + 5k^2 \\ \hline & -3k^2 + 16k \\ & +3k^2 - 15k \\ \hline & 1k - 5 \\ & -1k + 5 \\ \hline & 0 \end{array}$$

2) $(6p^3 - 7p^2 - 6p + 7) \div (p - 1)$

$$\begin{array}{r|l} & \boxed{6p^2 - 1p - 7} \\ \hline p-1 & 6p^3 - 7p^2 - 6p + 7 \\ & -6p^3 + 6p^2 \\ \hline & -1p^2 - 6p \\ & +1p^2 - 1p \\ \hline & -7p + 7 \\ & +7p - 7 \\ \hline & 0 \end{array}$$

3) $(x^3 + 5x^2 + 11x + 28) \div (x + 4)$

$$\begin{array}{r|l} & \boxed{x^2 + 1x + 7} \\ \hline x+4 & x^3 + 5x^2 + 11x + 28 \\ & -x^3 - 4x^2 \\ \hline & 1x^2 + 11x \\ & -1x^2 - 4x \\ \hline & 7x + 28 \\ & -7x - 28 \\ \hline & 0 \end{array}$$

4) $(20r^3 + 66r^2 + 20r - 50) \div (4r + 10)$

$$\begin{array}{r|l} & \boxed{5r^2 + 4r - 5} \\ \hline 4r+10 & 20r^3 + 66r^2 + 20r - 50 \\ & -20r^3 - 50r^2 \\ \hline & 16r^2 + 20r \\ & -16r^2 - 40r \\ \hline & -20r - 50 \\ & +20r + 50 \\ \hline & 0 \end{array}$$

5) $(3n^3 + 26n^2 + 56n + 35) \div (3n + 5)$

$$
\begin{array}{r|l}
 & n^2 + 7n + 7 \\
\hline
3n+5 & 3n^3 + 26n^2 + 56n + 35 \\
 & -3n^3 - 5n^2 \\
\hline
 & 21n^2 + 56n \\
 & -21n^2 + 35n \\
\hline
 & 21n + 35 \\
 & -21n + 35 \\
\hline
 & 0
\end{array}
$$

6) $(5m^3 + 38m^2 + 58m + 16) \div (5m + 8)$

$$
\begin{array}{r|l}
 & m^2 + 6m + 2 \\
\hline
5m+8 & 5m^3 + 38m^2 + 58m + 16 \\
 & -5m^3 - 8m^2 \\
\hline
 & 30m^2 + 58m \\
 & -30m^2 - 48m \\
\hline
 & 10m + 16 \\
 & -10m - 16 \\
\hline
 & 0
\end{array}
$$

7) $(-8x^4 - 42x^3 - 40x^2) \div (2x + 8)$

$$
\begin{array}{r|l}
 & -4x^3 - 5x^2 + 0x + 0 \\
\hline
2x+8 & -8x^4 - 42x^3 - 40x^2 + 0x + 0 \\
 & +8x^4 + 32x^3 \\
\hline
 & -10x^3 - 40x^2 \\
 & +10x^3 + 40x^2 \\
\hline
 & 0
\end{array}
$$

$\boxed{-4x^2 - 5x^2}$

8) $(9n^4 - 68n^3 + 31n^2 + 55n + 12) \div (9n + 4)$

$$
\begin{array}{r|l}
 & n^3 - 8n^2 + 7n + 3 \\
\hline
9n+4 & 9n^4 - 68n^3 + 31n^2 + 55n + \\
 & -9n^4 - 4n^3 \\
\hline
 & -72n^3 + 31n^2 \\
 & +72n^3 + 32n^2 \\
\hline
 & 63n^2 + 55n \\
 & -63n^2 + 28n \\
\hline
 & 27n \\
 & -27n + \\
\hline
 & 0
\end{array}
$$