



Name _____ Date _____ Period _____

DIVIDING POLYNOMIALS WORKSHEET

Use long division to divide the polynomials.

1) $(5x^3 - x^2 + 6) \div (x - 4)$

2) $(-12x - 14 + 15x^3 + 28x^2) \div (3x + 2)$

3) $(3c^4 + 2c^3 - 8c - 48) \div (c^2 - 4)$

4)
$$\frac{30x^4 - 5x^3 + 12x^2 - 20x}{6x - 1}$$

5) $(-13 - 8x^4 + 3x^5 + 7x^3 - 26x^2 + 34x) \div (3x - 2)$

6)
$$\frac{a^3 - 13a - 12}{a + 3}$$

7)
$$\frac{3x^3 + 4x + 11}{x^2 - 3x + 2}$$

8) Using the synthetic division provided, what was the original polynomial in standard form and what is the factored form of this polynomial?

$$\begin{array}{r|rrrrrr}
 -3 & 1 & 3 & -2 & -6 & 1 & 3 \\
 & \downarrow & -3 & 0 & 6 & 0 & -3 \\
 \hline
 & 1 & 0 & -2 & 0 & 1 & 0 \\
 -1 & \downarrow & -1 & 1 & 1 & -1 & \\
 \hline
 & 1 & -1 & -1 & 1 & 0 & \\
 -1 & \downarrow & -1 & 2 & -1 & & \\
 \hline
 & 1 & -2 & 1 & 0 & & \\
 1 & \downarrow & 1 & -1 & & & \\
 \hline
 & 1 & -1 & 0 & & &
 \end{array}$$

Use synthetic division to divide the polynomials.

9) $\frac{2a^4 - 5a^3 + a^2 - 9a + 6}{a - 3}$

10) $(14x^2 - 3x + 3x^3 + 7) \div (x + 5)$

11) $\frac{2x^3 + 11x^2 + 10x - 8}{x + 4}$

12) $(-3x^4 + 17x^3 - 11x^2 - 3x + 34) \div (x - 5)$

13) $\frac{2a^4 - 5a^3 + a^2 - 9a + 6}{a - 3}$

14) $(p^3 - 2p^2 - 28p - 15) \div (p + 4)$

15) Find the remainder when dividing $(x^3 + 2x^2 - 6x + 12)$ by $(x - 3)$.

Complete each statement to make it true.

16) $x + 2$ is a factor of $f(x)$ if and only if $f(x) \div (x + 2)$ has a remainder of _____.

17) $(x^4 - 3x^2 + 2x - 5) \div (x^2 - 2x + 3)$ can NOT be done using _____ division.

18) If $f(5) = 3$, then $f(x) \div (x - 5)$ has a _____ of 3.