

Polynomial Long Division Day 2

Divide. BEWARE OF MISSING TERMS!

Name Key

Date _____ Hour _____

1) $(n^3 - n^2 - 3) \div (n - 2)$

$$\begin{array}{r} n^2 + n + 2 \\ n-2 \overline{) n^3 - n^2 + 0n - 3} \\ \underline{-(n^3 - 2n^2)} \\ n^2 + 0n \\ \underline{-(n^2 - 2n)} \\ 2n - 3 \\ \underline{-(2n - 4)} \\ 1 \end{array}$$

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

2) $(p^3 + 7p^2 + 8) \div (p + 7)$

$$\begin{array}{r} p^2 + 0 \\ p+7 \overline{) p^3 + 7p^2 + 0p + 8} \\ \underline{-(p^3 + 7p^2)} \\ 0p^2 + 0p + 8 \\ \underline{0 + 0 + 8} \\ 8 \end{array}$$

$p^2 + \frac{8}{p+7}$

3) $(r^3 + 5r^2 - 29r + 23) \div (r - 3)$

$$\begin{array}{r} r^2 + 8r - 5 \\ r-3 \overline{) r^3 + 5r^2 - 29r + 23} \\ \underline{-(r^3 - 3r^2)} \\ 8r^2 - 29r \\ \underline{-(8r^2 - 24r)} \\ -5r + 23 \\ \underline{-(-5r + 15)} \\ 8 \end{array}$$

$r^2 + 8r - 5 + \frac{8}{r-3}$

4) $(x^3 + 2x^2 + 10) \div (x + 2)$

$$\begin{array}{r} x^2 + 0 \\ x+2 \overline{) x^3 + 2x^2 + 0x + 10} \\ \underline{-(x^3 + 2x^2)} \\ 0 + 0x + 10 \\ \underline{0 + 0x + 10} \\ 0 \end{array}$$

$x^2 + \frac{10}{x+2}$

5) $(b^3 - 90b + 101) \div (b + 10)$

$$\begin{array}{r} b^2 - 10b + 10 \\ b+10 \overline{) b^3 + 0b^2 - 90b + 101} \\ \underline{-(b^3 + 10b^2)} \\ -10b^2 - 90b \\ \underline{-(-10b^2 - 100b)} \\ 10b + 101 \\ \underline{-(10b + 100)} \\ 1 \end{array}$$

$b^2 - 10b + 10 + \frac{1}{b+10}$

6) $(6r^3 - 52r^2 - 14r - 32) \div (r - 9)$

$$\begin{array}{r} 6r^2 + 2r + 4 \\ r-9 \overline{) 6r^3 - 52r^2 - 14r - 32} \\ \underline{-(6r^3 - 54r^2)} \\ 2r^2 - 14r \\ \underline{-(2r^2 - 18r)} \\ 4r - 32 \\ \underline{-(4r - 36)} \\ 4 \end{array}$$

$6r^2 + 2r + 4 + \frac{4}{r-9}$

7) $(10x^3 - 36x^2 - 46x - 18) \div (10x + 4)$

$$\begin{array}{r} x^2 - 4x - 3 \\ 10x+4 \overline{) 10x^3 - 36x^2 - 46x - 18} \\ \underline{-(10x^3 + 4x^2)} \\ -40x^2 - 46x \\ \underline{-(-40x^2 - 16x)} \\ -30x - 18 \\ \underline{-(-30x - 12)} \\ -6 \end{array}$$

$x^2 - 4x - 3 - \frac{3}{5x+2}$

8) $(2p^3 - 16p^2 + 34p - 13) \div (2p - 2)$

$$\begin{array}{r} p^2 - 7p + 10 \\ 2p-2 \overline{) 2p^3 - 16p^2 + 34p - 13} \\ \underline{-(2p^3 - 2p^2)} \\ -14p^2 + 34p \\ \underline{-(-14p^2 + 14p)} \\ 20p - 13 \\ \underline{-(20p - 20)} \\ 7 \end{array}$$

$p^2 - 7p + 10 + \frac{7}{2p-2}$

$$9) (42n^3 + 130n^2 + 52n - 84) \div (6n + 10)$$

$$\begin{array}{r} 7n^2 + 10n - 8 \\ 6n+10 \overline{) 42n^3 + 130n^2 + 52n - 84} \\ \underline{-(42n^3 + 70n^2)} \end{array}$$

$$\begin{array}{r} 60n^2 + 52n \\ \underline{-(60n^2 + 100n)} \\ -48n - 84 \\ \underline{-(-48n - 80)} \\ -4 \end{array}$$

$$\boxed{7n^2 + 10n - 8 - \frac{2}{3n+5}}$$

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

$$\begin{array}{r} x^2 + 2 \\ x+4 \overline{) x^3 + 4x^2 + 2x + 0} \\ \underline{-(x^2 + 4x^2)} \end{array}$$

$$\begin{array}{r} 0 + 2x + 0 \\ \underline{-(2x + 8)} \\ -8 \end{array}$$

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

$$13) (n^4 - 3n^3 - 70n^2 + 6) \div (n + 7)$$

$$\begin{array}{r} n^3 - 10n^2 \\ n+7 \overline{) n^4 - 3n^3 - 70n^2 + 0n + 6} \\ \underline{-(n^4 + 7n^3)} \\ -10n^3 - 70n^2 \\ \underline{-(-10n^3 - 70n^2)} \end{array}$$

$$\begin{array}{r} 0 + 0n + 6 \end{array}$$

$$\boxed{n^3 - 10n^2 + \frac{6}{n+7}}$$

$$15) (10r^3 + 13r^2 - 97r - 32) \div (10r + 3)$$

$$\begin{array}{r} r^2 + r - 10 \\ 10r+3 \overline{) 10r^3 + 13r^2 - 97r - 32} \\ \underline{-(10r^3 + 3r^2)} \end{array}$$

$$\begin{array}{r} 10r^2 - 97r \\ \underline{-(10r^2 + 3r)} \end{array}$$

$$\begin{array}{r} -100r - 32 \\ \underline{-(-100r - 30)} \\ -2 \end{array}$$

$$\boxed{r^2 + r - 10 - \frac{2}{10r+3}}$$

$$10) (k^3 + k^2 - 2k - 32) \div (k - 3)$$

$$\begin{array}{r} k^2 + 4k + 10 \\ k-3 \overline{) k^3 + k^2 - 2k - 32} \\ \underline{-(k^3 - 3k^2)} \end{array}$$

$$\begin{array}{r} 4k^2 - 2k \\ \underline{-(4k^2 - 12k)} \\ 10k - 32 \\ \underline{-(10k - 30)} \\ -2 \end{array}$$

$$\boxed{k^2 + 4k + 10 - \frac{2}{k-3}}$$

$$12) (m^3 - 7m^2 - m) \div (m - 7)$$

$$\begin{array}{r} m^2 - 1 \\ m-7 \overline{) m^3 - 7m^2 - m + 0} \\ \underline{-(m^3 - 7m^2)} \end{array}$$

$$\begin{array}{r} 0 - m + 0 \\ \underline{-(-m + 7)} \\ -7 \end{array}$$

$$\boxed{m^2 - 1 - \frac{7}{m-7}}$$

$$14) (a^4 + 19a^3 + 95a^2 + 53a + 21) \div (a + 10)$$

$$\begin{array}{r} a^3 + 9a^2 + 5a + 3 \\ a+10 \overline{) a^4 + 19a^3 + 95a^2 + 53a + 21} \\ \underline{-(a^4 + 10a^3)} \end{array}$$

$$\begin{array}{r} 9a^3 + 95a^2 \\ \underline{-(9a^3 + 90a^2)} \end{array}$$

$$5a^2 + 53a$$

$$\boxed{a^3 + 9a^2 + 5a + 3 - \frac{9}{a+10}}$$

$$\begin{array}{r} (5a^2 + 50a) \\ 3a + 21 \\ \underline{-(3a + 30)} \\ -9 \end{array}$$

$$16) (7n^3 - 2n^2 + 35n) \div (7n - 2)$$

$$\begin{array}{r} n^2 + 5 \\ 7n-2 \overline{) 7n^3 - 2n^2 + 35n + 0} \\ \underline{-(7n^3 - 2n^2)} \end{array}$$

$$\begin{array}{r} 0 + 35n + 0 \\ \underline{-(35n - 10)} \end{array}$$

$$10$$

$$\boxed{n^2 + 5 + \frac{10}{7n-2}}$$

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

$$12) (m^3 - 7m^2 - m) \div (m - 7)$$

$$13) (n^4 - 3n^3 - 70n^2 + 6) \div (n + 7)$$

$$14) (a^4 + 19a^3 + 95a^2 + 53a + 21) \div (a + 10)$$

$$15) (10r^3 + 13r^2 - 97r - 32) \div (10r + 3)$$

$$16) (7n^3 - 2n^2 + 35n) \div (7n - 2)$$

Write the slope-intercept form of the equation of the line through the given points.

17) through: (2, 4) and (0, 5)

$$m = \frac{4-5}{2-0} = \frac{-1}{2} \quad \boxed{y = -\frac{1}{2}x + 5}$$

18) through: (1, -4) and (0, -5)

$$m = \frac{-4+5}{1-0} = \frac{1}{1} = 1 \quad \boxed{y = x - 5}$$

Write the slope-intercept form of the equation of the line described.

19) through: (5, -2), parallel to $y = -\frac{1}{5}x - 3$

$$y + 2 = -\frac{1}{5}(x - 5)$$

$$y + \underline{2} = -\frac{1}{5}x + \underline{1}$$

$$\boxed{y = -\frac{1}{5}x - 1}$$

20) through: (-4, -5), parallel to $y = \frac{1}{2}x - 2$

$$y + 5 = \frac{1}{2}(x + 4)$$

$$y + \underline{5} = \frac{1}{2}x + \underline{2}$$

$$\boxed{y = \frac{1}{2}x - 3}$$

21) through: (1, 0), perp. to $y = -x - 1$

$$y - 0 = 1(x - 1)$$

$$\boxed{y = x - 1}$$

22) through: (-1, -1), perp. to $y = \frac{1}{2}x + 2$

$$y + 1 = -2(x + 1)$$

$$y + \underline{1} = -2x - \underline{2}$$

$$\boxed{y = -2x - 3}$$

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8) $(2p^3 - 16p^2 + 34p - 13) \div (2p - 2)$

9) $(42n^3 + 130n^2 + 52n - 84) \div (6n + 10)$

10) $(k^3 + k^2 - 2k - 32) \div (k - 3)$