HW 6-4
Dividing Polynomials

Name: Key
Period: _____

Given a polynomial divisor and dividend, use long division to find the quotient and remainder.

1. $(18x^3-3x^2+x-1)\div(x^2-4)$

$$18x-3$$
$$x^2-4\overline{)\,18x^3-3x^2+x-1}$$
$$+(-18x^3 \quad +72x)$$
$$-3x^2+73x-1$$
$$+(+3x^2 \quad +-12)$$
$$73x-13$$

$$18x-3+\frac{73x-13}{x^2+4}$$

2. $(6x^4+x^3-9x+13)\div(x^2+8)$

$$6x^2+x-48+\frac{-17x+397}{x^2+8}$$
$$x^2+8\overline{)\,6x^4+x^3+0x^2-9x+13}$$
$$-(6x^4 \quad +48x^2)$$
$$x^3-48x^2-9x+13$$
$$-(x^3 \quad +8x)$$
$$-48x^2-17x+13$$
$$+(+48x^2 \quad +384)$$
$$-17x+397$$

3. $(x^3+25x^2+100x)\div(x+20)$

$$x^2+5x$$
$$x+20\overline{)\,x^3+25x^2+100x}$$
$$+-x^3+-20x^2$$
$$5x^2+100x$$
$$-(5x^2+100x)$$
$$0$$

Given a polynomial *p(x)*, use synthetic division to divide by *x* – *a* and obtain the quotient and the (nonzero) remainder.

4. $(7x^3-4x^2-400x-100)\div(x-8)$

$$8\,|\;7 \quad -4 \quad -400 \quad -100$$
$$\downarrow \quad 56 \quad 416 \quad 128$$
$$7x^2+52x+16 \quad |\;28$$

$$7x^2+52x+16+\frac{28}{x-8}$$

5. $(2.5x^3+6x^2-5.5x-10)\div(x+1)$

$$-1\,|\;2.5 \quad 6 \quad -5.5 \quad -10$$
$$\downarrow \quad -2.5 \quad -3.5 \quad 9$$
$$2.5x^2+3.5x \quad -9 \quad |\;-1$$

$$2.5x^2+3.5x-9+\frac{-1}{x+1}$$

6. $(3x^3-11x^2-56x-50)\div(x+4)$

-4 | 3 | −11 | −56 | −50
↓ | | −12 | 92 | −144

$3x^2$ + −23x + 36 | −194

$3x^2-23x+36+\frac{-194}{x+4}$

7. Given that the height of a rectangular prism is $x+2$ and the volume is x^3-x^2-6x, write an expression that represents the area of the top face of the prism.

h

-2 | 1 | −1 | −6 | 0
↓ | | −2 | 6 | 0

$1x^2$ | −3x | 0 | 0

x^2-3x

$(x^2-3x)(x+2)$

8. Explain the error: Two students used synthetic division to divide $3x^3-2x-8$ by $x-2$. Determine which solution is correct. Find the error in the other solution.

A.	B.
2 | 3 | 0 | −2 | −8 6 | 12 | 20 3 | 6 | 10 | 12 correct	2 | 3 0 −2 −8 −6 12 −20 3 −6 10 −28 they multiplied by 2

Review

Graph the function $f(x)=\begin{cases}(x+2)^2, & x<0\\ -1, & x>0\end{cases}$