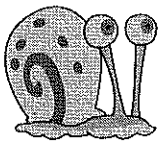
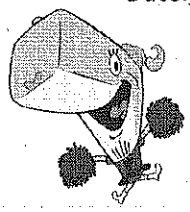
Name:_____ _____ Date:_____



5.6 & 5.7 Practice Problems



Directions: Use long division to divide.

1. $(-40x - 8x^3 + 19x^2 + 22 + 3x^4) \div (-2 + 3x)$

$x^3 - 2x^2 + 5x - 10$ R2

$3x-2 \overline{)\ 3x^4 - 8x^3 + 19x^2 - 40x + 22}$

$-3x^4 + 2x^3$

$-6x^3 + 19x^2 - 40x + 22$

$+6x^3 \mp 4x^2$

$15x^2 - 40x + 22$

$-15x^2 + 10x$

$-30x + 22$

$+30x \mp 20$

2

2. $(9n^5 - 6n^4 - 90n + 64) \div (9n - 6)$

$n^4 - 10$ R4

$9n-6 \overline{)\ 9n^5 - 6n^4 + 0n^3 + 0n^2 - 90n + 64}$

$-9n^5 + 6n^4$

$-90n + 64$

$+90n \mp 60$

4

Directions: (A) Evaluate the given function at the given value
(B) What is the divisor?
(C) Is it a factor?

3. $f(a) = 3a^4 - 21a^3 + 30a^2 + 11 \; at \; a = -5$

(A) 5261

(B) $(x+5)$

(C) NO

4. $f(a) = -6a^6 + 32a^5 - 5a^4 - 30a^3 + 19a^2 + 35a - 25 \; at \; a = 5$

(A) 0

(B) $(x-5)$

(C) yes

Directions: Use the Rational Root Theorem to find all zeros.

5. $x^4 - 2x^3 + x^2 - 8x - 12 = 0$

$\frac{p}{q} = \frac{\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12}{\pm 1}$

Possible Roots: $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$

Actual Roots: $-1, 3, 2i, -2i$

Factored Form: $(x-3)(x^2+4)(x+1)$

1 | 1 -2 1 -8 -12
↓ 1 -1 0 -8
1 -1 0 -8 | -20

-1 | 1 -2 1 -8 -12
↓ -1 3 -4 12
1 -3 4 -12 | 0

$x^3 - 3x^2 + 4x - 12$

$x^2(x-3) + 4(x-3)$

$(x-3)(x^2+4) = 0$

6. $2x^4 + x^3 - 16x^2 - 5x + 30 = 0$

$\frac{p}{q} = \frac{\pm 1, \pm 2, \pm 3, \pm 5, \pm 6, \pm 10, \pm 15, \pm 30}{\pm 1 \ \pm 2}$

Possible Roots: $\pm 1 \ \pm 2 \ \pm 3 \ \pm 5 \ \pm 6 \ \pm 10 \ \pm 15 \ \pm 30 \ \pm 1/2 \ \pm 3/2 \ \pm 5/2$

Actual Roots: $\pm 15/2$ $-2, \sqrt{5}, -\sqrt{5}, 3/2$

Factored Form: $(2x-3)(x^2-5)(x+2)$

-2 | 2 1 -16 -5 30
-4 6 20 -30
2 -3 -10 15 | 0

$2x^3 - 3x^2 - 10x + 15$

$x^2(2x-3) - 5(2x-3)$

$(2x-3)(x^2-5)$