

Out of ~~3~~

HW 15

4.3. 1, 2, 4

1. $f(x) = \frac{1}{3}x^7 - 8x^3 + \sqrt{5}x - 8$

- coefficients are real numbers ✓
- powers are ~~real~~ ^{nonnegative} integers, ~~positive~~ ✓

so it is a **polynomial**

2. $g(x) = \frac{8x^3 - 5x + 3}{7x^2} = \frac{8}{7}x - \frac{5}{7}x^{-1} + \frac{3}{7}x^{-2}$

- coefficient are real ✓
- powers are nonnegative integers X

so it is **NOT a polynomial**

3. $f(x) = \frac{3x - 5x^3}{11} = \frac{3}{11}x - \frac{5}{11}x^3$

- coefficients are real ✓
- powers are nonnegative integers ✓

so it is a **polynomial**

a) $f(x) = \frac{1}{3}x^7 - 8x^3 + \sqrt{5}x - 8$ (5,1)

degree: 7

- leading coefficient: $\frac{1}{3}$
- constant coefficient: -8

b.) $f(x) = \frac{3}{11}x - \frac{5}{11}x^3$

deg: 3

leading coefficient: $-\frac{5}{11}$

constant coefficient: 0

4.3.10

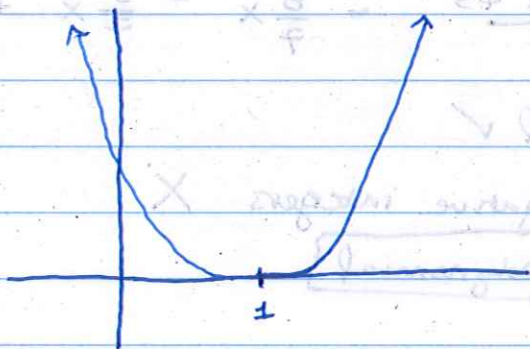
10. $f(x) = \frac{1}{2}(x-1)^4$

opens up

wide

flatter at $x=1$

shift 1 to right



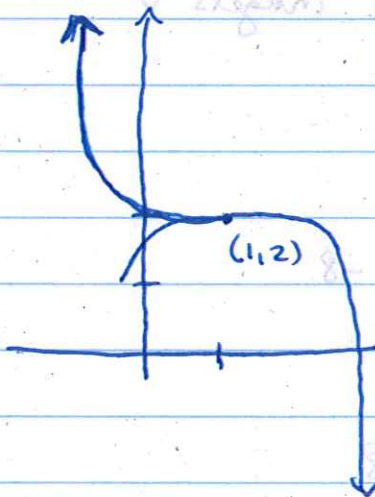
15.) $f(x) = -(x-1)^5 + 2$

flipped

right 1

up 2

flatter



5

4.3.36

$$f(x) = x^2(x+2)(x-2)$$

left behavior: ∞

right behavior: ∞

y-intercept: $y=0$

real zeros: $x = 0, -2, 2$

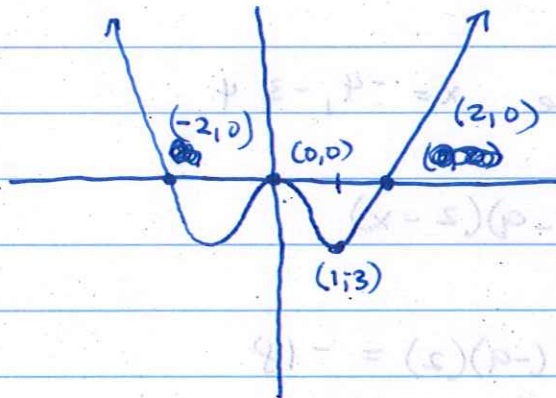
multiplicity $x = -2$ is 1

$x = 2$ is 1

$x = 0$ is 2

test point: $x = 1, f(1) = (1)^2(1+2)(1-2) = -3$

graph:



4.3.45 a.) odd

b.) positive

c.) 0

d.) $x = -2$, odd mult.

$x = 0$, odd mult.

$x = 3$, odd mult.

e.) $x(x+2)(x-3)$

4.3.16.) a) degree is odd

b.) leading coefficient is negative

4.3.21.) a) degree is odd

b.) leading coefficient is negative

4.3.23) $f(x) = x^3 + 3x^2 - 16x - 48$

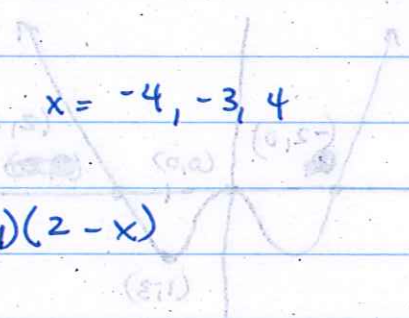
y-intercept: $-48 = y$

$f(x) = x^2(x+3) - 16(x+3)$

$= (x^2 - 16)(x+3)$

$= (x+4)(x-4)(x+3)$

x-intercepts are $x = -4, -3, 4$



4.3.25) $f(x) = (x^2 - 9)(2 - x)$

y-intercept: $y = (-9)(2) = -18$

$f(x) = (x+3)(x-3)(2-x)$

x-intercepts: $x = -3, 2, 3$

4.3.30) $f(x) = -5(x-2)(x^2-4)^3$

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

$= -5(x-2)^4(x+2)^3$

a) real zeros: $x = 2, -2$

b.) multiplicity of $x = -2$ is 3 ; $x = 2$ is 4

↑
crosses

↑
touches

1
1
19