HW help →

HW Questions

(No WARM UP yet)

Curving / Scaling of Ch. 7 TEST

83 → 95

RAW score

0 ... 100

- 20

63/83

75/95

75.9%

79%

HW
Questions
?

24 $y = 3^{(x)}$

↓ 4 → 7

18

$$\sqrt{(x-4)^2 + (y-3)^2} = \sqrt{25}$$

$$(x-4) + (y-3) = 5$$???

No can't take sq. root of separate terms.

$2+3$

$c = 5$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(5)}}{2(1)} = \frac{-2 \pm \sqrt{24}}{2} = \frac{-2 \pm 2\sqrt{6}}{2}$$

$$x = \frac{2(-1 \pm \sqrt{6})}{2}$$

$x = -1 \pm \sqrt{6}$ are the two x intercepts

8-17

a. $y = 3x^2 + 2x^2 + x$ Polynomial

b. $y = (x-1)^2(x-2)^2$ Polynomial (If multiplied out, every term would be number $\cdot x^{\text{whole number}}$

c. $y = x^2 + 2^x$ Not because of 2nd term

d. $y = 3x - 1$ Polynomial

e. $y = (x-2)^2 - 1$ Polynomial

f. $y^2 = (x-2)^2 - 1$ Not if you isolated y we would get $y = \pm\sqrt{(x-2)^2 - 1}$

g. $y = \frac{1}{x^2} + \frac{1}{x} + \frac{1}{2}$ Not - the first term would be x^{-2}

h. $y = \frac{1}{2}x + \frac{1}{3}$ Polynomial

i. $y = x$ Polynomial

j. $y = -7$ Polynomial

8-19

a. $x^2-6x+8=0$

$(x-2)(x-4)=0$

$x-2=0 \quad x-4=0$

$x=2 \quad x=4$

so roots of equation are 2 and 4

b. $x^2-6x+9=0$

$(x-3)(x-3)=0$

$x-3=0$ same

3 is the root of the equation $y=x^2-6x+9$

$x^3-4x=0$

c) $y=x^3-4x$

$y=x(x^2-4)$ diff. of squares

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

$0=x(x+2)(x-2)$

$x=0 \quad x+2=0 \quad x-2=0$

$x^3-4x=0$

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

$x(x+2)(x-2)=0$

$x-2=0$

$x=2$

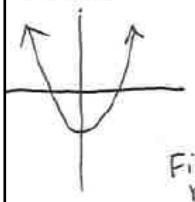
$x(x^2-4)=0$

$x=0 \quad x^2-4=0$

$x^2=4$

$x=\pm 2$

8-20 $y = x^2 - 7$



Since the graph shows 2 x-intercepts, there must be 2 roots (at least).
but since $y = x^2 - 7$ is degree 2, th there is at most 2 roots.

Find the roots of the equation

Set $y = 0$ $\quad x^2 - 7 = 0$

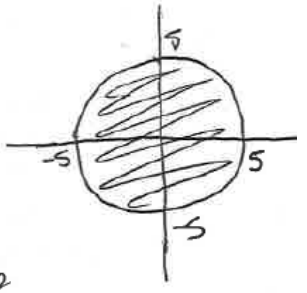
$x^2 = 7$

$\sqrt{\quad} \quad \sqrt{\quad}$

$x = \pm\sqrt{7}$

So, $\pm\sqrt{7}$ are the two roots

8-22 Graph $x^2 + y^2 \leq 25$



TEST (0,0)

$0^2 + 0^2 \leq 25$

TRUE

so, shade inside

8-24 $y = 3^x$

a) DOWN 4 $\quad y = 3^x - 4$

b) RIGHT 7 $\quad y = 3^{x-7}$

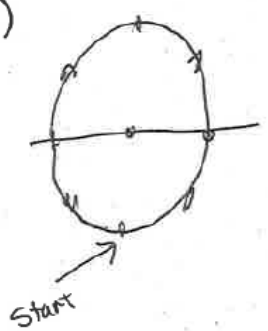
8-35

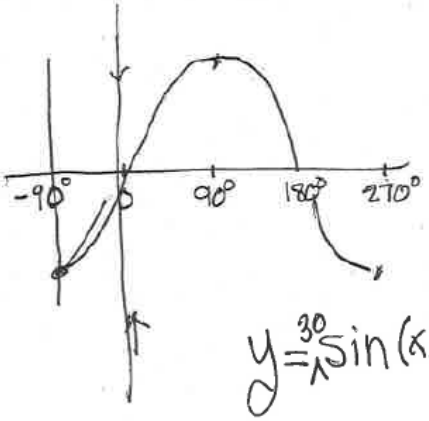
angle (x)	-90°	-45°	0°	45°	90°	135°	180°	225°	270°
height (y)	-30'	-21.2'	0'	21.2'	30'	21.2'	0'	-21.2'	-30'

a) To reflect the wheel going around continuously we could continue the graph (but we won't)

b) maximum distance above (or below) center is 30 feet

c)





$y = 30\sin(x)$

Today:

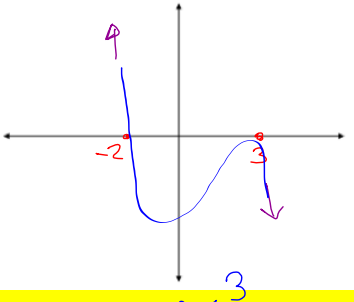
Long Warm Up, short lesson

1. **Check your HW**
from yesterday.

2. pick up and do the
Warm Up

1.

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



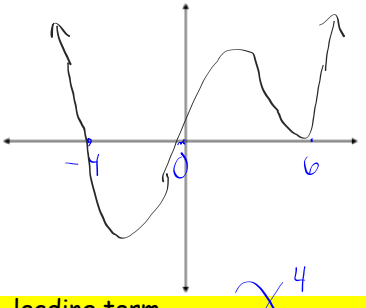
leading term $-x^3$

degree 3 (odd)

orientation (−) ↘

end behavior ↑ ↓

$g(x) = x(x+4)(x-6)^2$



leading term x^4

degree 4

orientation (+) ↗ ↗

end behavior ↑ ↑

Previously

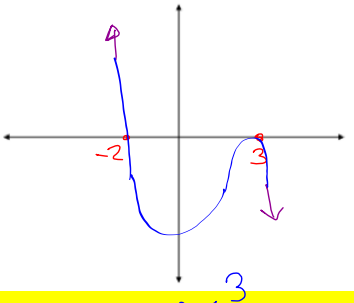
Squared factors indicate double roots (creating x-intercepts that bounce)

Single roots (create x-intercepts that cross)

( )

(1)

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



leading term $-x^3$

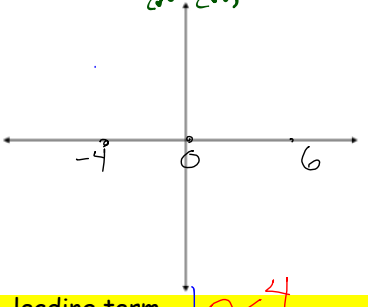
degree 3 (odd)

orientation (−)

end behavior

$g(x) = x(x+4)(x-6)^2$

(0,0) (6,0) bounce



leading term x^4

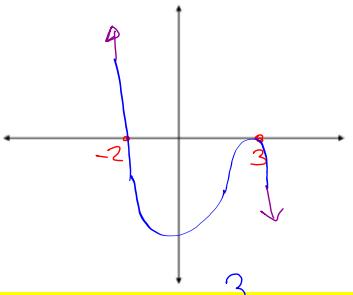
degree 4

orientation (+)

end behavior

1

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



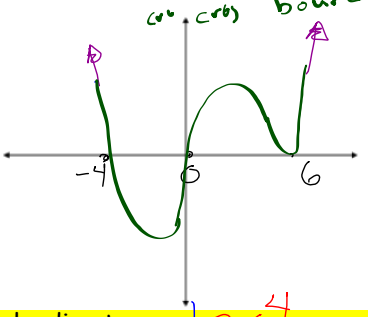
leading term $-x^3$

degree 3 (odd)

orientation (−)

end behavior ↑ ↓

$g(x) = x(x+4)(x-6)^2$

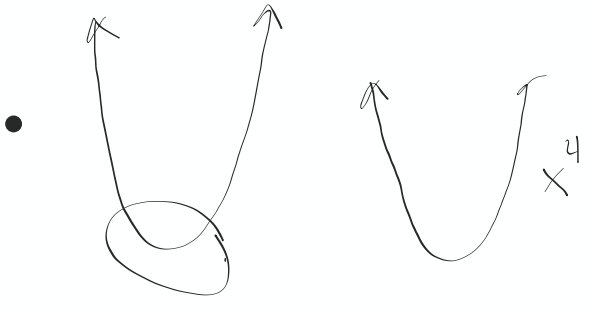


leading term x^4

degree 4

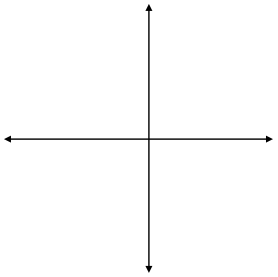
orientation (+)

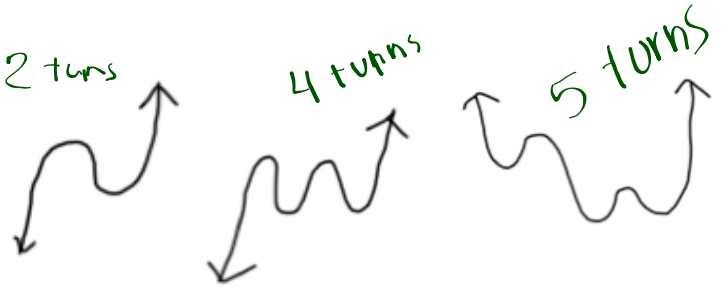
end behavior ↑ ↑



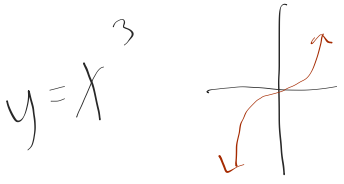
$x^2 - 7x + 6$

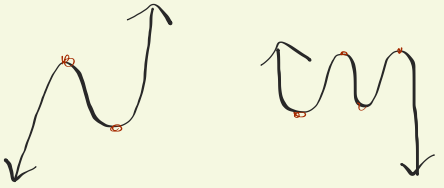
2. Given the graph of 4 functions below, what would be the minimum degree of each function ?



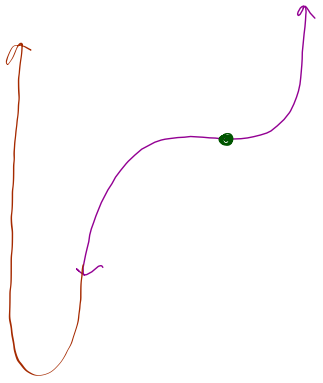


The degree is at least: 3 5 6





The minimum degree of a polynomial is equal to the number of turns plus 1



inflection points count as extreme points, too.

3. Find the exact roots of $f(x) = x^2 + 6x - 8$

$0 = x^2 + 6x - 8$

$a = 1$
$b = 6$
$c = -8$

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(-8)}}{2(1)}$$

$\sqrt{4}\ \sqrt{17}$

$$x = \frac{-6 \pm \sqrt{68}}{2}$$

$$= \frac{-6 \pm 2\sqrt{17}}{2}$$

$$= \frac{-6}{2} \pm \frac{2\sqrt{17}}{2}$$

$$= -3 \pm \sqrt{17}$$

4
9
16
25
36
49
64

$x = \frac{-6 \pm \sqrt{68}}{2}$

but $\sqrt{68} = \sqrt{4}\sqrt{17}$

$= 2\sqrt{17}$

$x = \frac{-6 \pm 2\sqrt{17}}{2}$

$= -\frac{6}{2} \pm \frac{2\sqrt{17}}{2}$

$x = -3 \pm \sqrt{17}$

The roots are $-3 \pm \sqrt{17}$

4. Predict the roots of $k(x) = x(x + 10)(2x - 1)$

0 $\quad -10 \quad \frac{1}{2}$

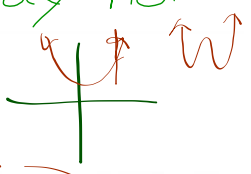
$2x - 1 = 0$

$2x = 1$

$x = \frac{1}{2}$

5 Could a polynomial with degree 2 not have any real **zeros**? Why ?

Yes, because the graph may not cross the x-axis



6. Could a polynomial with degree 5 not have any real **zeros**? Why ?

No odd degree graphs must have opposite end behavior so the graphs must cross the x-axis

7. Complete each statement in regards to polynomial, $Q(x)$, that crosses the $x-axis$ at $x=-7$

-7 is a Zero **of Q(x)**

-7 is a root of the equation: $Q(x)=0$

-7 is an x-intercept **of the graph of $Q(x)$.**

8. Circle the polynomials:

$y = 3x^2 + 2x - \sqrt{x}$

$f(x) = x^2 - 8x$

$g(x) = (x-2)^3 - 1$

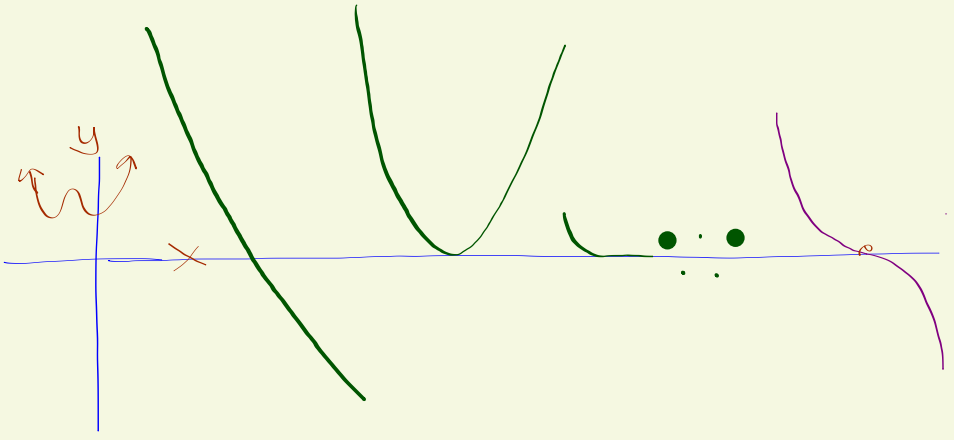
$y = \frac{1}{x^2} + \frac{3}{x} + 3$

$y = 2x + 1$

$x^2 + y^2 = 25$

$y = -7$

$y = (x-2)^3(x+10)^2$



Polynomial Graphs either cross or they "bounce". There is no 3rd option.

Continuation from last class:

Polynomials that have repeated factors

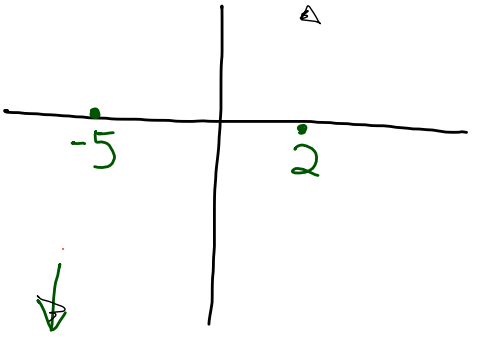
Previously

Squared factors indicate double roots (creating x-intercepts that bounce)

Single roots (create x-intercepts that cross)

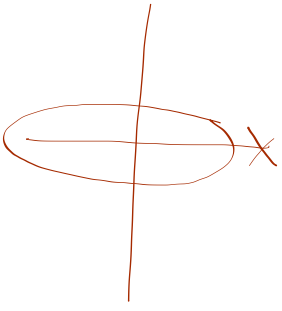
$P_1(x) = (x-2)(x+5)^2$

cross at 2 bounce at -5



Triple roots ?

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



-5

Tadbit

factors with odd exponents $(x-5)^3, (x+2), (x+8)^5$ have crossing x-intercepts

factors with even exponents $(x-1)^2, (x+2)^4$, etc have x-intercepts that bounce (turn)

Sketching practice

(No calculators)

have your notes handy

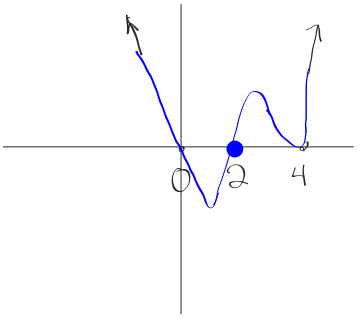
$y = x^1(x-2)^3(x-4)^2$

lead term x^6

degree 6

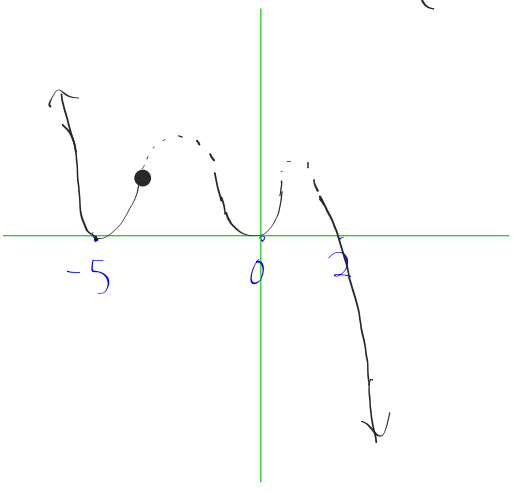
orientation (+)

end behavior ↑ ↑



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

$(3,4)$ $-x^9$



5

5 minutes

1. Make up a polynomial for your partner to sketch.
2. Swith papers. Sketch
3. Rotate again to check each other's answers

LCQ
on sketching Polynomials
- NOTES ok!
- but No GDC

Assignment

8.....36-40, 44c