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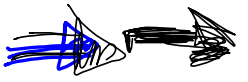
Check your solutions to yesterday's HW.

then

HW Help



HW Questions

check #36

8-36

where does $y = (x+3)^2 - 5$ cross x-axis? → set $y=0$

$(x+3)^2 - 5 = 0$

$(x+3)^2 = 5$

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

$x+3 = \pm\sqrt{5}$

$x = -3 \pm \sqrt{5}$

$(-3+\sqrt{5}, 0)$ and $(-3-\sqrt{5}, 0)$

8-37

$f(x) = (x-74)^2(x+29)$ would inter

$(x-74)^2(x+29) = 0$

Use Zero Prod Prop

$x-74=0$ $\quad$ $x+29=0$

At

or

$x = 74$ $\quad$ $x = -29$

a bounced

8-38 $(-3,0)$ $(2,0)$ $\Longrightarrow$ $y = (x+3)(x-2)$

(a) $y = x^2 - 2x + 3x - 6$

$y = x^2 + x - 6$ ← 1 possible answer

(b) $(-3,0)$ $(\frac{1}{2},0)$ $\Rightarrow y=(x+3)(x-\frac{1}{2})$

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

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

could also introduce stretch factor of 2 to get $y = 2x^2 + 5x - 3$

8-39

a) $P(x) = .08x^2 + .28x$ degree 2

b) $y = 8x^2 - \frac{1}{7}x^5 + 9$ degree 5

$5x^3$

c) $f(x) = 5(x+3)(x-2)(x+7)$ degree 3

d) $y = (x-3)^2(x+1)(x^3+1)$ degree 6

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8-40

a) Parabolas are written as $y = ax^2$ (Polynomial)

b) Exponentials, $y = 2^x$, for example (NOT)

c) cubics $y = 2x^3$ (Polynomial - can be written in form $y = ax^n$)

d) Lines $y = 3x + 2$ (Polynomial)

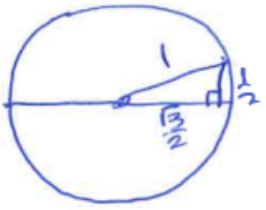
e) Circles (NOT)

8-44c

Find all solutions in interval $0° \leq \theta \leq 360°$

$\cos\theta = \frac{\sqrt{3}}{2}$

↖ Positive so to the right



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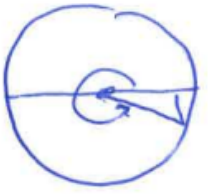

So $30°$ and $330°$

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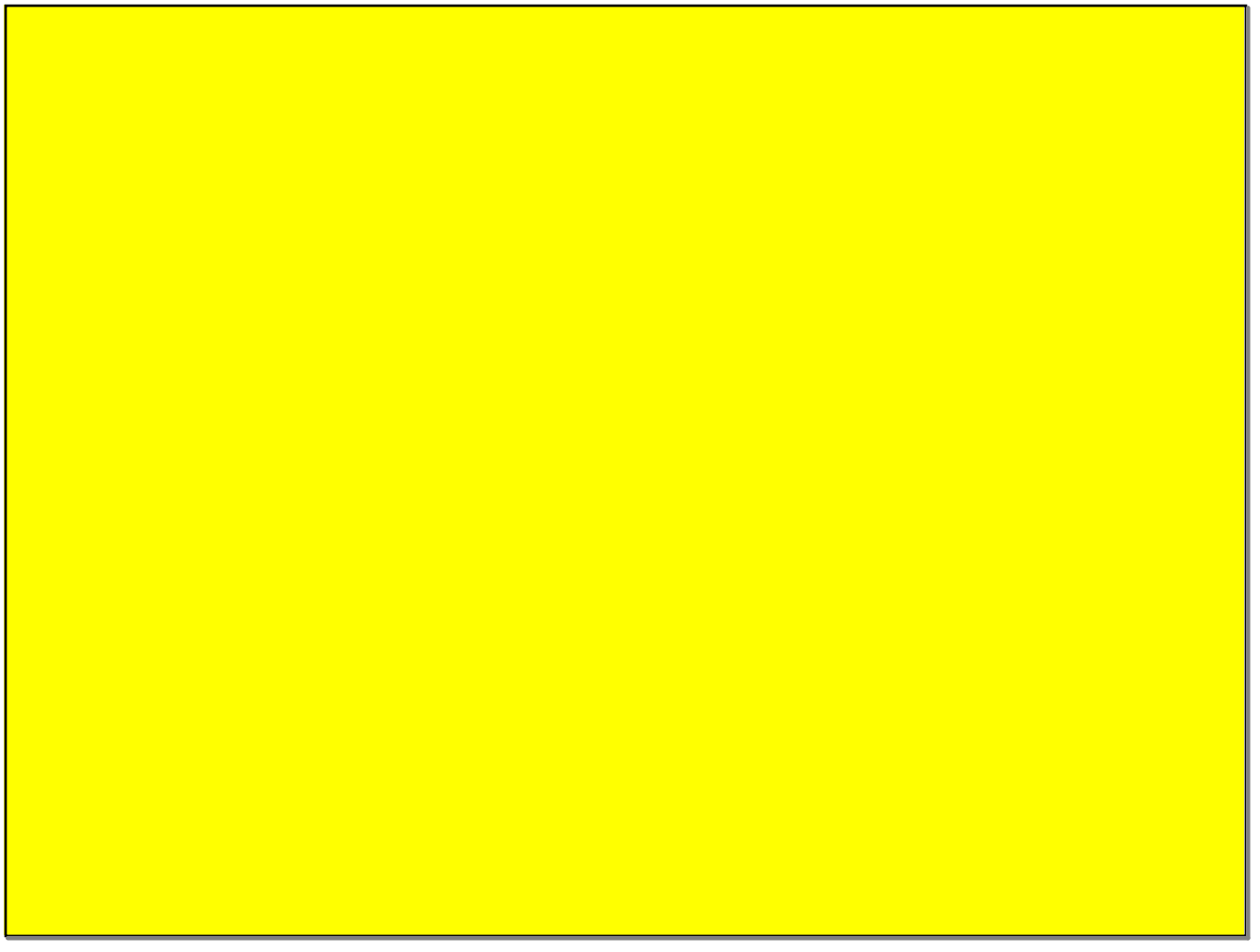


If you were asked to write an equation of a polynomial in standard form and you were given two x-intercepts

$(5, 0)$ $(-8, 0)$

How would you begin?

$y = (x - 5)(x + 8)$

Pick up the warm up

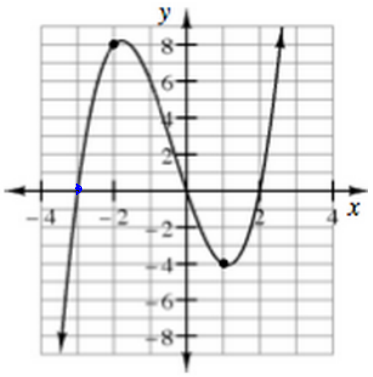
do #1 only

Warm Up

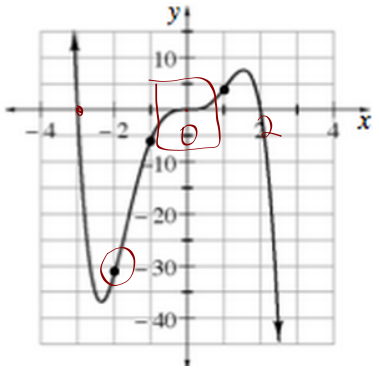
1

Find reasonable equations for each of the following polynomial functions.

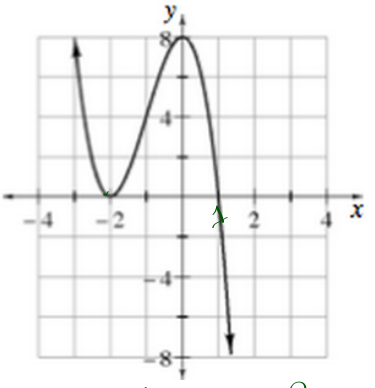
a.



b.



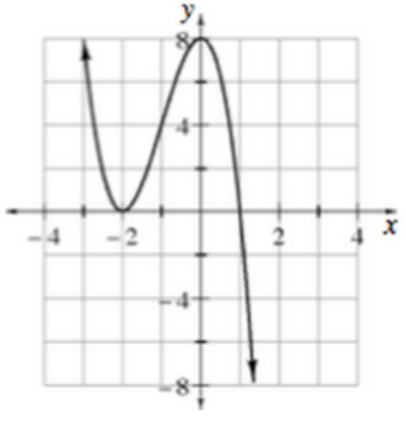
c.



$y = (x+3)(x-2)$ $y = a(x+3)x^3(x-2)$ $y = a(x+2)^2(x-1)$

Without using a graphing calculator, how can you check the accuracy of your equations? Were each of your equations accurate? If not, why do you think your equation(s) were not accurate?

c.



Now calculate the y-intercept

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

$\uparrow 0 \qquad \uparrow 0$

$y = -(2)^2(-1)$

$y = -4(-1)$

$y = 4$

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today

Create polynomial equations that represent all points on the graphs (not just the x-intercepts)

back side of Warm Up

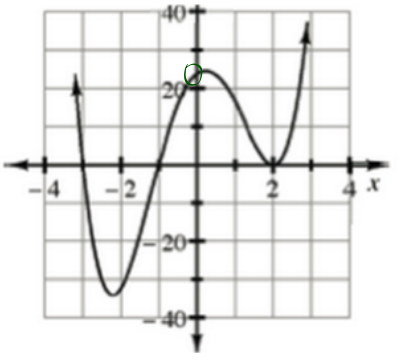
To be used later in class

Suppose the person next to you wrote the equation

$$y = \frac{(x+3)(x+1)(x-2)^2}{\text{to represent the graph at right.}}$$

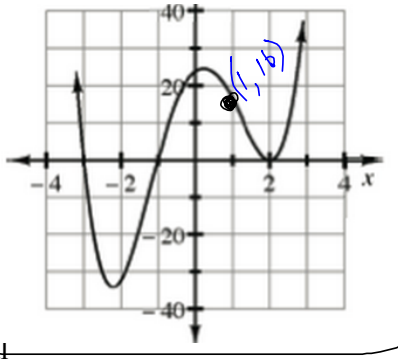
1. Explain how you can decide how well the equation represents the graph. What can you do to the equation to make it a *better fit* for the graph? What equation would fit better?

ARE THE INTERCEPTS ENOUGH?



GDC

pick a point on the graph (x,y) and plug it in.



2. Before you figured it out, you could have written the polynomial for this graph as $P(x) =$ $a(x+3)(x+1)(x-2)^2$. What if you did not have a graphing calculator, but you were told that the graph goes through the point (1, 16)? How could you use that information to determine the exact equation? Once you have decided on a method with your team, try it. How can you test the accuracy of your equation?

$y = a(x+3)(x+1)(x-2)^2$

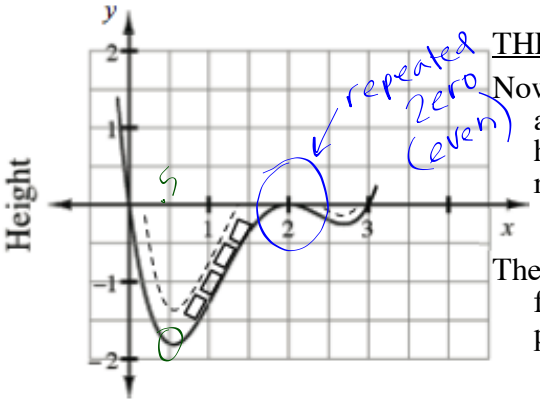
$16 = a(1+3)(1+1)(1-2)^2$

$16 = a(4)(2)(1)$

$16 = 8a$

$\boxed{a = 2}$

$y = a(x+3)(x+1)(x-2)^2$ $(1, 16)$



THE COUNTY FAIR COASTER RIDE

Now that you have more expertise with polynomial equations and their graphs, the Mathamericaland Carnival Company ha hired your team to find the *exact* equation to represent its roller-coaster track.

The numbers ~~along~~ the *x*-axis are in hundreds of feet. At 250 feet, the track will be 20 feet below the surface. This gives th point (2.5, –0.2).

1. What degree polynomial represents the portion of the roller coaster represented by the graph at right? 4
2. What are the roots? $x = 2, 3, 0$
3. Find an exact equation for the polynomial that will generate the curve of the track.

$y = a(x-2)^2(x-3)(x)$

$-.2 = a(2.5-2)^2(2.5-3)(2.5)$

$-.2 = a(.5)^2(-.5)(2.5) \Rightarrow -.2 = -.3125a$

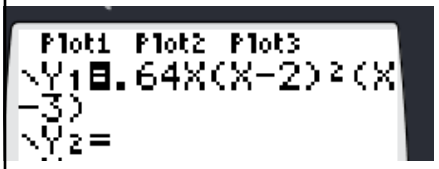
$a = .64$

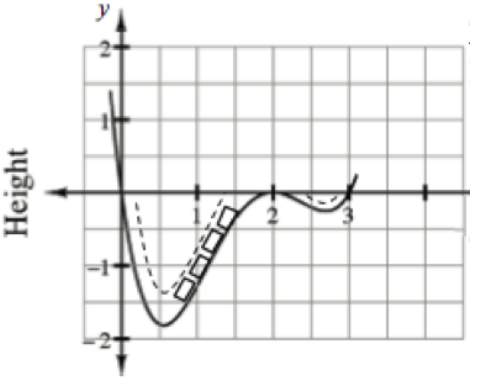
4. What is the deepest point of the roller coaster's tunnel?

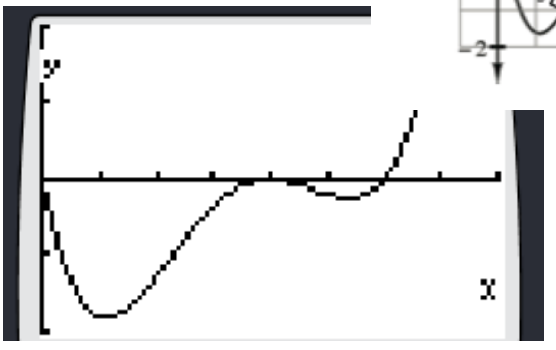
$y = .64(x-2)^2(x-3)(x)$

plug in $x = .5$

4. What is the deepest point of the roller coaster's tunnel?







≈ 181 feet below ground

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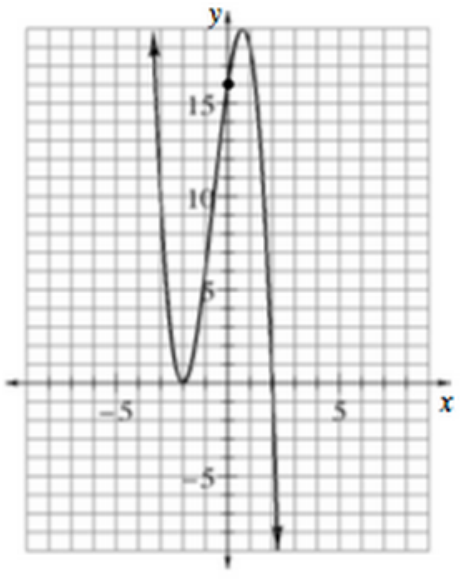
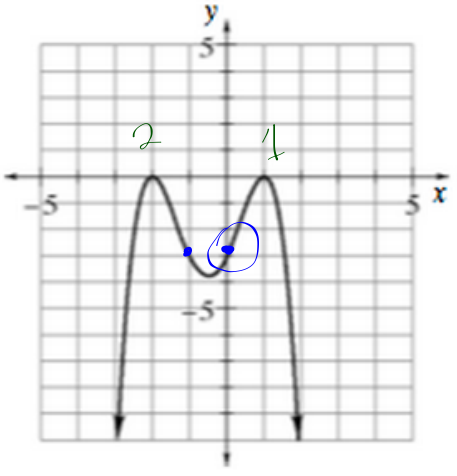
8 - 49b

be prepared to show your process on the doc cam.

a.



b.



$(0;-3)$

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

$-3 = a(0+2)^2(0-1)^2$

$a = -\frac{3}{4}$

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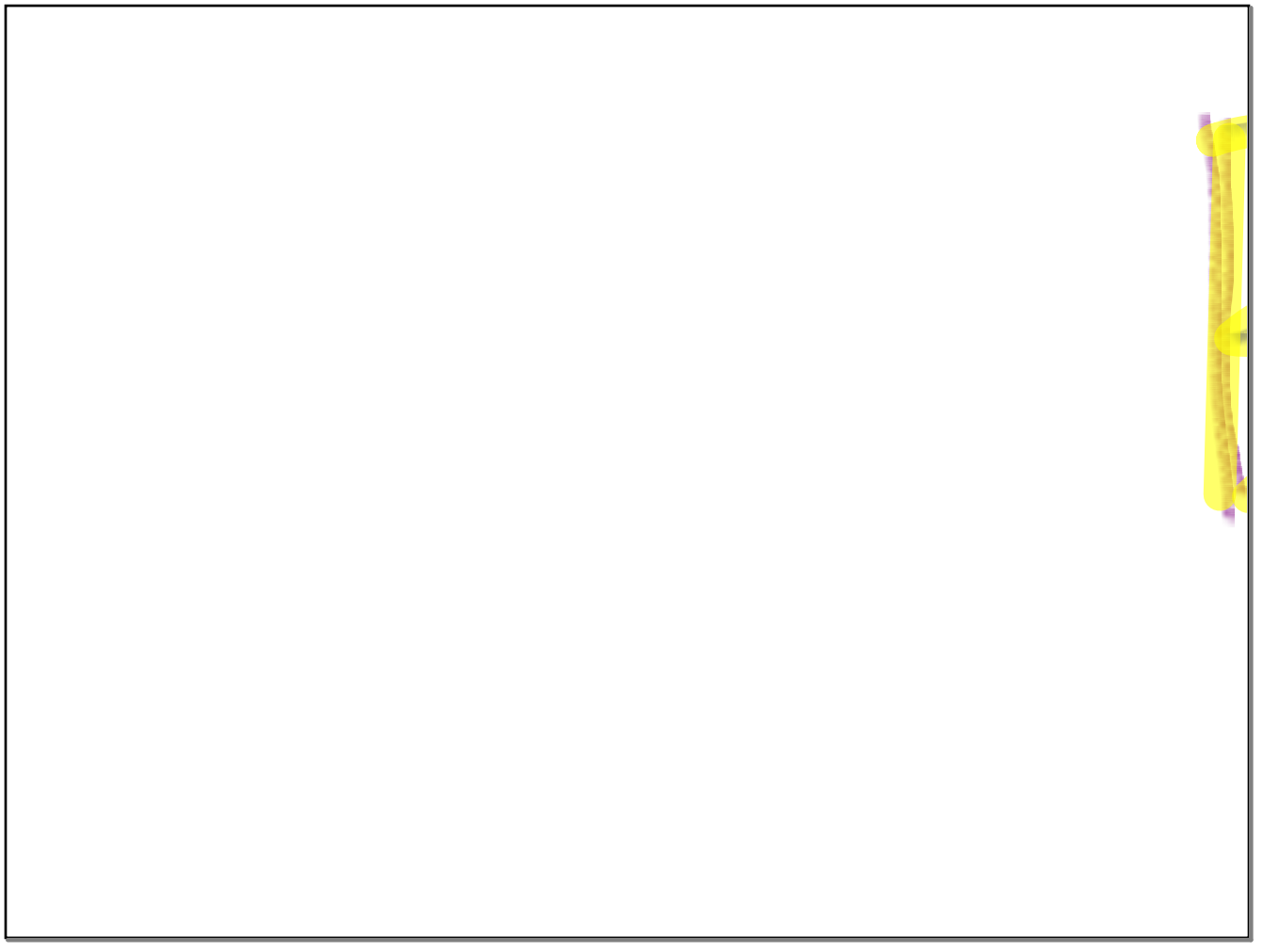

do the following questions

in your notes

50 → 51 ⇝ 53

8-50 bounce at $(-1,0)$ crosses at $(4,0)$ through $(-2,-18)$

Likely answer by many

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

8-51

Armando $y = 3(x+1)^4(x-4)$

Does it work ?

Check Additional Point

$(-2, -18)$

$-18 = 3(-2+1)^4(-2-4)$

$-18 = 3(-1)^4(-6)$

$-18 = -18$

yes

8-52 New additional point $(1, -36)$

Original

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

$-36 = 3(1+1)^2(1-4)$

$-36 = 3(2)^2(-3)$

$-36 = -36$

Armando's

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

$= 3(1+1)^4(1-4)$

$= 3(2)^4(-3)$

$-36 \neq$

You have to know how many times a factor is used (is repeated),

by knowing the degree of the polynomial

OR

you need an additional point to check.

8....54-58, 59b, 60,62

$a_1 =$

$a_0 =$

55a

coefficients a_4

a_3

a_2

a_1

a_0