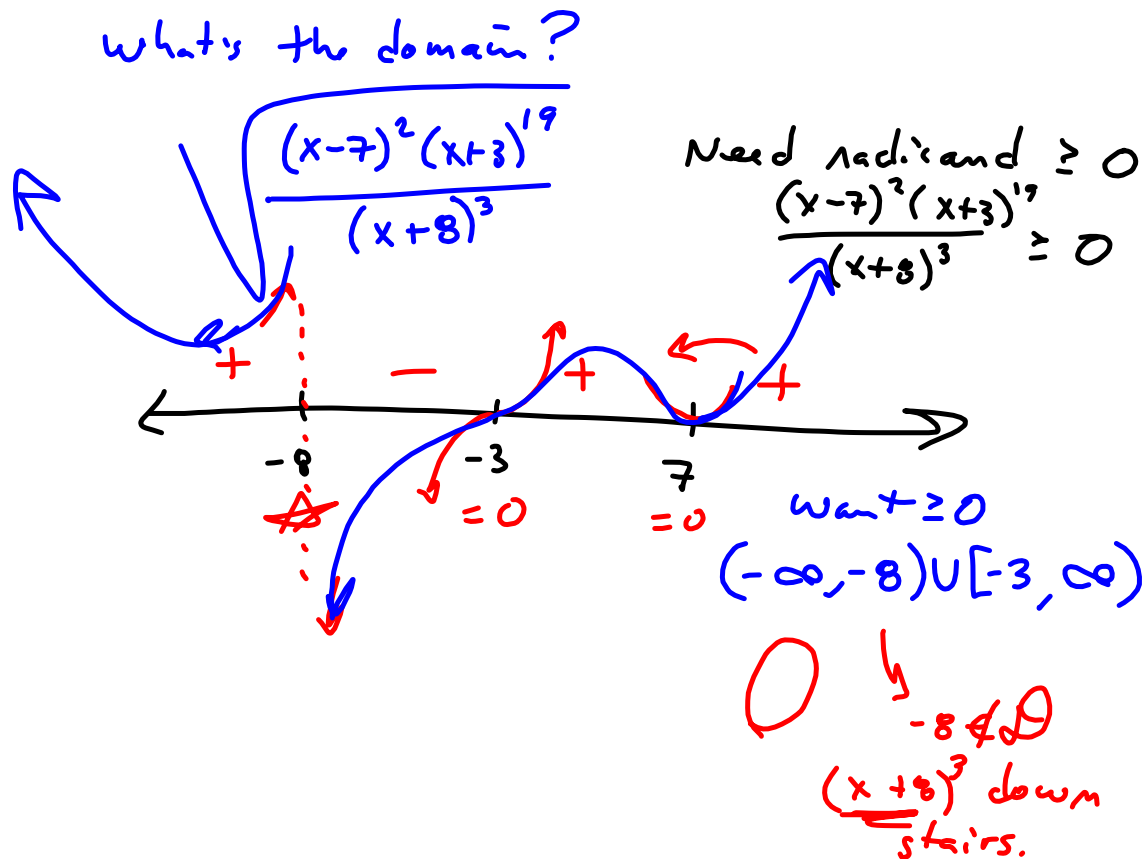
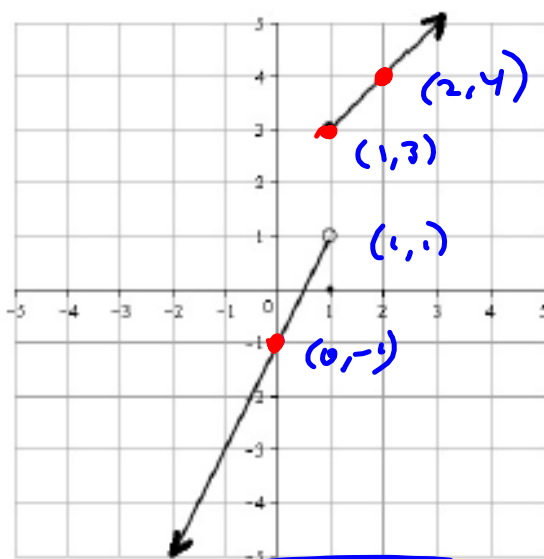


So, I noticed, after grading test 3's that I never posted Test 2 solutions - AND nobody asked. This makes me think people aren't re--hashing old tests and making sure they get 'em right.

If there's something you got wrong, Murphy sez it will show up on the next exam and the next and the next and the next and..... and the final.

Noticing poor quality work on some of the homework, when *exactly* what I'm looking for is *handed* to you. Get it right or know the reason why. Ask.





$$y = m(x - x_1) + y_1$$

$$x \geq 1$$

$$m = \frac{4-3}{2-1} = \frac{1}{1} = 1$$

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

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$x < 1$$

$$m = \frac{1+1}{1-0} = \frac{2}{1} = 2$$

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

$$f(x) = \begin{cases} (x-2)+4 & x \geq 1 \\ 2(x-1)+1 & x < 1 \end{cases}$$

(2008, 800)
(2012, 900)

Zombies

$$P(t) = P_0 e^{kt}$$

$t=0$ represents 2008

$$\text{year} - 2008 = t$$

$$2008 - 2008 = 0$$

$$2012 - 2008 = 4$$

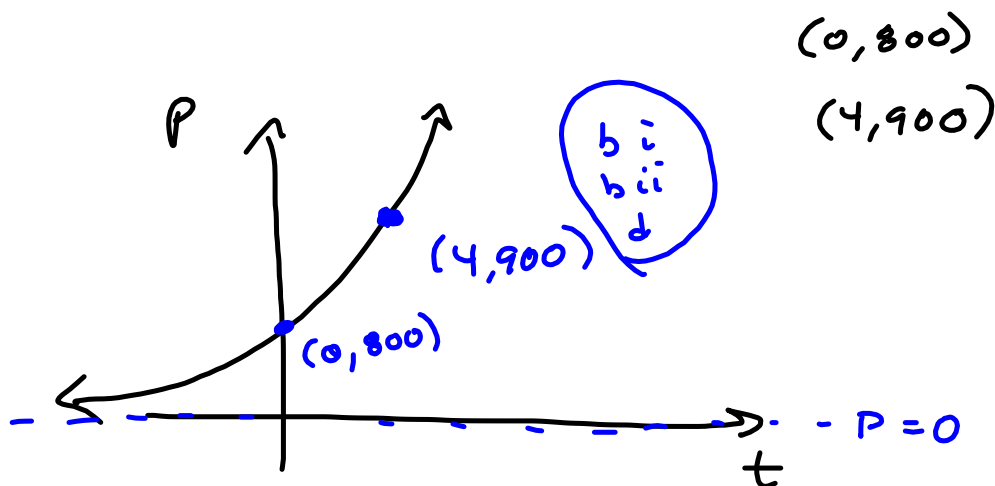
Define variables (words & units)

P = # of bees as a function
of ...

... t = # of years after 2008

$$P_0 = P(0) = 800$$

$$P(4) = 900$$



$$P(t) = P_0 e^{kt}$$

Use what you
have!

$$\frac{.0294 \ln(900/800)}{4} \quad \text{whence?}$$

$(0, 800)$ means $P(0) = P_0 e^{k \cdot 0} = 800$
 $(4, 900)$ $= P_0 e^0 = 800$
 $= P_0 = 800$

This gives $P(t) = 800 e^{kt}$

Other point means.

$$P(4) = 900$$

$$800 e^{k \cdot 4} = 900$$

$$800 e^{4k} = 900$$

Growth rate is k !

$$\ln x = \log_e x$$

$$e^{4k} = \frac{900}{800} = \frac{9}{8}$$

$$e^{4k} = \frac{9}{8}$$

$$\log_e(e^{4k}) = \ln(e^{4k}) = \ln(9/8)$$

```
ln((9/8)/4
-1.268511325
ln(9/8)/4
.0294457589
```

$$4k = \ln(9/8)$$

$$k = \frac{\ln(9/8)}{4}$$

$$\approx .0294$$

is growth rate!

(Ci)

$$\text{So } P_0 e^{kt} \approx 800 e^{.0294 t} = P(t)$$

(Cii)

I hate the way this is posed.

Too much round off error in k , if you want to use it for predictions.

I'd use $\ln(9/8)/4$ is EXACT.

Only turn calculator on at the end of e

But follow instructions.

② Estimate Pop. in 2017.

Kevin's TI 30 sequence would be

$$.0294 * 9$$

=
2nd ln (For e^x) This gives him $e^{.0294 * 9}$
x 800 to get $800e^{(.0294)(9)}$

```
ln((9/8)/4
-1.268511325
ln(9/8)/4
.0294457589
800e^(.0294*9)
1042.327766
■
```

Needed to do exponential before
multiplying by 800.

Needed to do $(.0294)(9)$ before
doing e^x thing.

About 1042

when will pop reach 1000?

use $k = .0294$

Pop is 1000

$$P(t) = 1000$$

$$800 e^{.0294 t} = 1000$$

Solve for t

$$e^{.0294 t} = \frac{1000}{800} = \frac{5}{4}$$

" \approx " should
be use throughout.
.0294 is
approximate.

$$.0294 t = \ln(5/4)$$

$$t = \frac{\ln(5/4)}{.0294} \approx 7.58$$

i.e., 2015