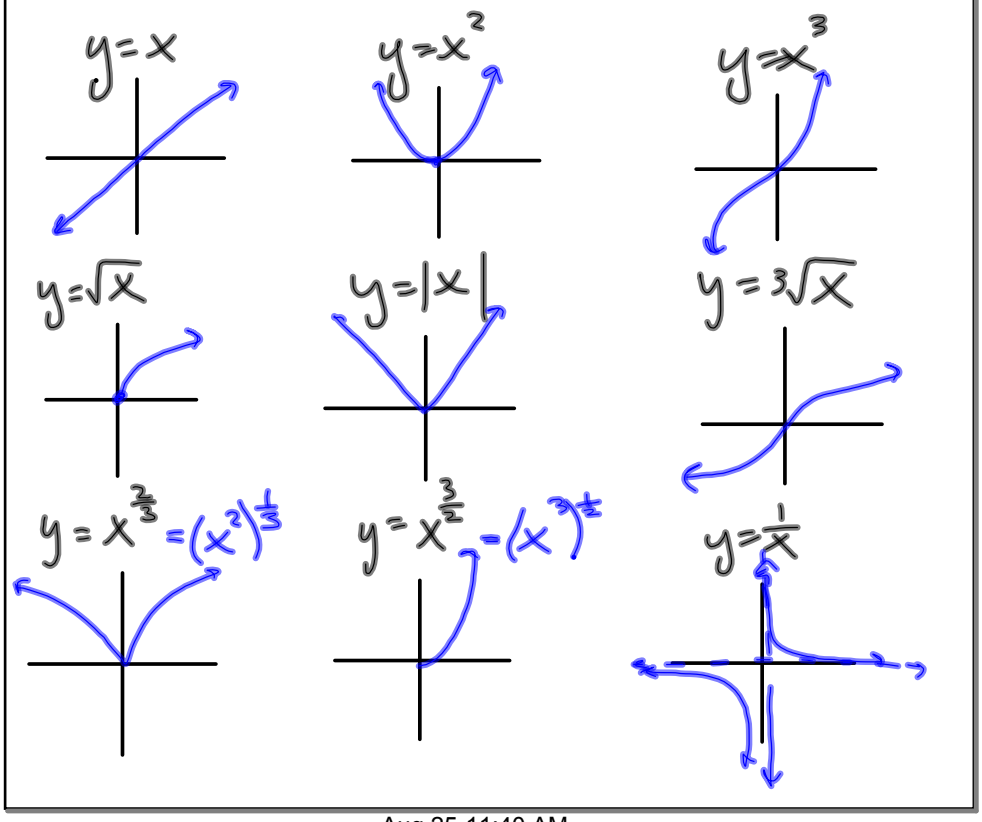
1.3 Exp Fncs



Aug 25-11:40 AM

Transformations

outside: vertical

inside: horizontal

Addition/Sub. translation

Mult./Div. stretch or compression

Negative reflection

$f(x)=x^2$

$g(x)=x^2+3$ up 3

$h(x)=(x+3)^2$ left 3

$j(x)=3x^2$ v. str. by 3

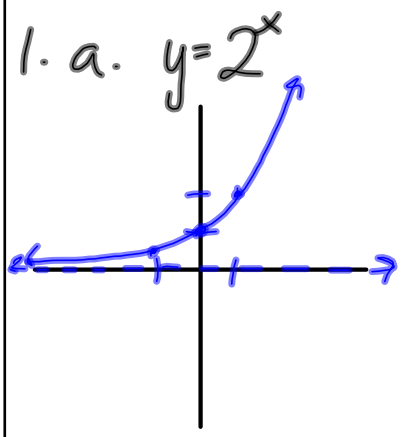
$k(x)=(3x)^2$ h. comp. by $\frac{1}{3}$

$m(x)=-x^2$ refl. over x-axis

$n(x)=(-x)^2$ refl. over y-axis

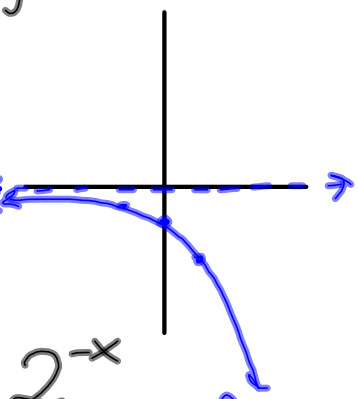
Aug 25-12:29 PM

1. a. $y = 2^x$

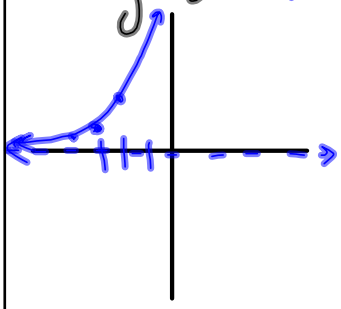


b. $y = -2^x$ refl. over x axis

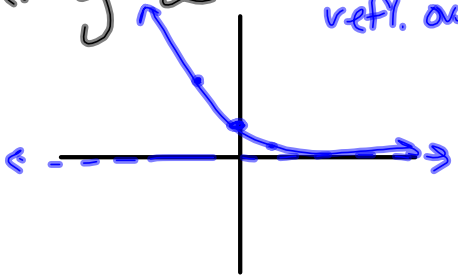
x	y
0	1
1	2
-1	$2^{-1} = \frac{1}{2}$



c. $y = 2^{(x+3)}$ left 3

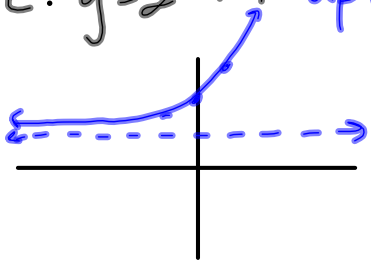


d. $y = 2^{-x}$ refl. over y-

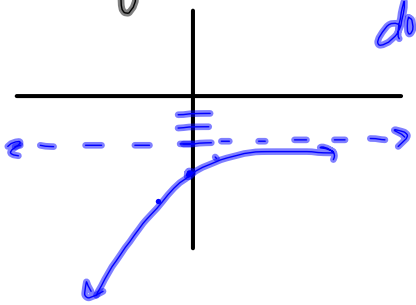


Aug 25-12:37 PM

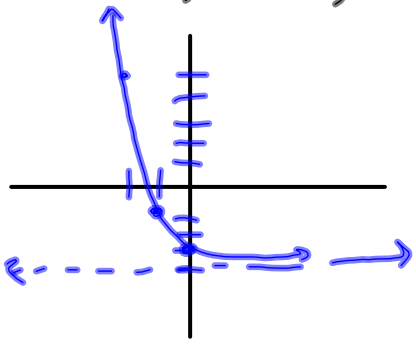
e. $y = 2^x + 1$ up 1



f. $y = -2^{-x} - 3$ refl. over x, y, down 3



2. $f(x) = \left(\frac{1}{3}\right)^x - 4$ decay, down 4



x	y
0	-3
-1	$(\frac{1}{3})^{-1} - 4 = 3 - 4 = -1$
-2	5

Aug 25-12:46 PM

4. 16^{3x}

$(2^4)^{3x}$

2^{12x}

5. $\left(\frac{1}{27}\right)^x$

$\left(\frac{1}{3^3}\right)^x$

$(3^{-3})^x = 3^{-3x}$

Aug 25-12:51 PM

6. $f(x) = 3 \cdot 2^x$

on calc!

$x \approx 1.585$

* 3 decimals!

Aug 25-12:54 PM

RS #16

$y = y_0 e^{kt}$ $\quad y = y_0(1 \pm r)^t$

7. a. $y = 300000(1 + .0249)^{10}$

$y \approx 383650.869$

b. $\frac{900{,}000}{300000} = \frac{300000(1.0249)^t}{300000}$

$\ln 3 = \ln 1.0249^t$

$\frac{\ln(3)}{\ln 1.0249} = \frac{t \ln 1.0249}{\ln 1.0249}$

$t \approx 44.668$ yrs.

Aug 25-12:59 PM

8. $P(t) = P_0(.5)^{t/k}$

k: length of half-life

a. $P(t) = 95(.5)^{t/16}$

b. $\frac{10}{95} = \frac{95(.5)^{t/16}}{95}$

$\ln \frac{10}{95} = \ln(.5)^{t/16}$

$16 \frac{\ln \frac{10}{95}}{\ln(.5)} = \frac{t}{16} \ln(.5) \cdot 16$

$t \approx 51.967$ days

Aug 25-1:07 PM

9. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

n: # of times compounded per yr.

$2 = 1\left(1 + .0399\right)^{t}$

$\ln 2 = \ln 1.0399^{t}$

$\frac{\ln 2}{\ln 1.0399} = \frac{t \ln 1.0399}{\ln 1.0399}$ $t \approx 17.716$ yrs.

Aug 25-1:12 PM