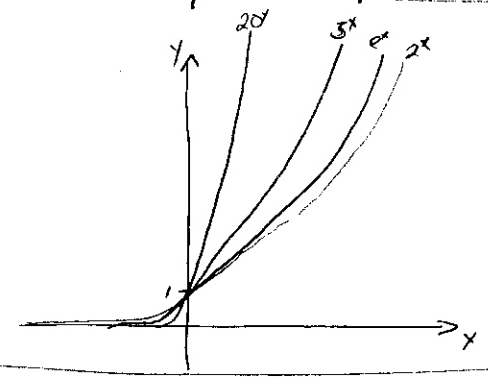
SM 121 LESSON 7 3/6/10/13/16/21/25 2 SEP 08

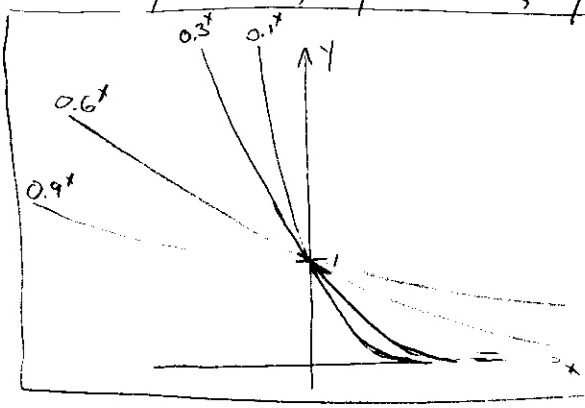
SECTION 1.5 EXPONENTIAL FUNCTIONS

3) GRAPH $y = 2^x$, $y = e^x$, $y = 5^x$, $y = 20^x$



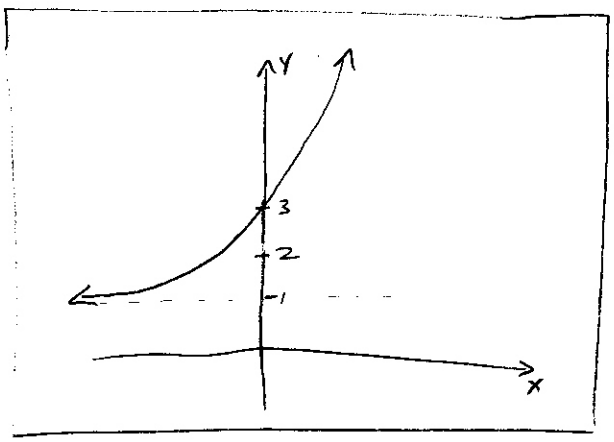
FUNCTIONS WITH LARGER BASES ACCELERATE AWAY FROM THE X-AXIS FASTER

6) GRAPH $y = 0.9^x$, $y = 0.6^x$, $y = 0.3^x$, $y = 0.1^x$



FUNCTIONS WITH A SMALLER BASE APPROACH ZERO FASTER.

10) GRAPH $y = 1 + 2e^x$



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13) STARTING WITH $y = e^x$

(a) SHIFT DOWN 2. $\boxed{y = e^x - 2}$

(b) SHIFT RIGHT 2 $\boxed{y = e^{(x-2)}}$

(c) REFLECT ABOUT X-AXIS $\boxed{y = -(e^x)}$

(d) REFLECT ABOUT Y-AXIS $\boxed{y = e^{-x}}$

(e) REFLECT ABOUT X- AND Y-AXIS $\boxed{y = -(e^{-x})}$

16) FIND THE DOMAIN OF $g(t) = \sin(e^{-t})$ AND $g(t) = \sqrt{1-2^t}$

(a)

DOMAIN OF e^{-t} IS $\mathbb{R}$ $\therefore$ DOMAIN OF $g(t)$ IS $\mathbb{R}$

DOMAIN OF $\sin t$ IS $\mathbb{R}$

(b) $\{t \mid 1 - 2^t \geq 0\} = \{t \mid 2^t \leq 1\} = \{t \mid t \leq 0\}$ $\therefore$ DOMAIN OF $g(t)$ IS $(-\infty, 0]$

21)

$f(24) = 24^2 = 576$ INCHES $= 48$ feet.

$g(24) = 2^{24} = 16,777,216$ inches $= 1398101'4'' \approx 264.79$ MILES

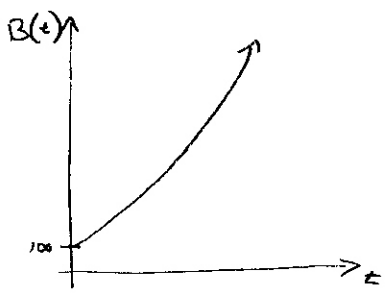
25) ⓐ $B(t) = 100 \cdot 2^{\frac{t}{3}}$

$B(15) = 100 \cdot 2^{\frac{15}{3}} = 100(32) = \boxed{3200}$

ⓑ $\boxed{B(t) = 100\left(2^{\frac{t}{3}}\right)}$

ⓒ $B(t) = 100\left(2^{\frac{20}{3}}\right) = \boxed{10159.367}$

ⓓ



$50000 = 100\left(2^{t/3}\right)$

$500 = 2^{t/3}$

$\frac{t}{3} = \log_2 500$

$t = 3\log_2 500$

$t \approx 3(8.966)$

$\boxed{t \approx 26.897 \text{ hours}}$