Algebra 2-REVIEW FOR TEST NAME_____

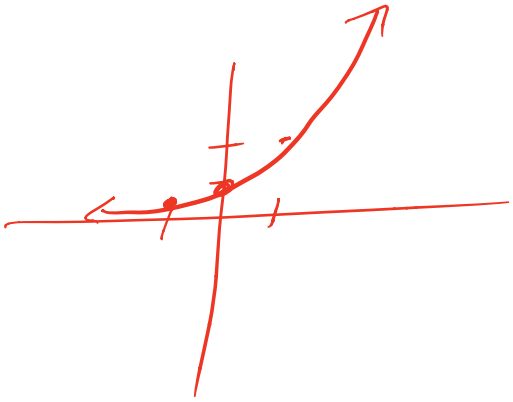
WITHOUT A CALCULATOR

Graph the following by hand. Find and label the key point, asymptote, domain, and range. (5 pts EACH)

5. $y = 2^x$

asymptote $y=0$
key point _____
domain $(-\infty, \infty)$
range $(0, \infty)$

x	y
-1	1/2
0	1
1	2

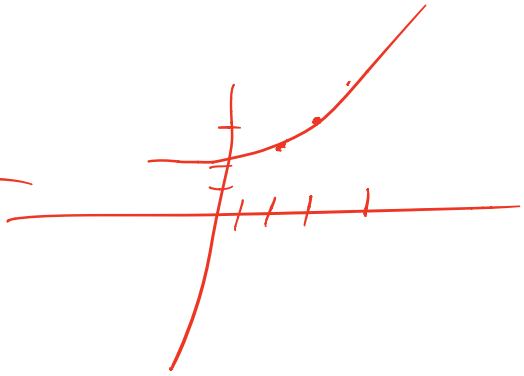


6 $y = 2^{x-3} + 2$

asymptote $y=2$
key point _____
domain $(-\infty, \infty)$
range $(2, \infty)$

R+3 up 2

x	y
2	2 1/2
3	3
4	4

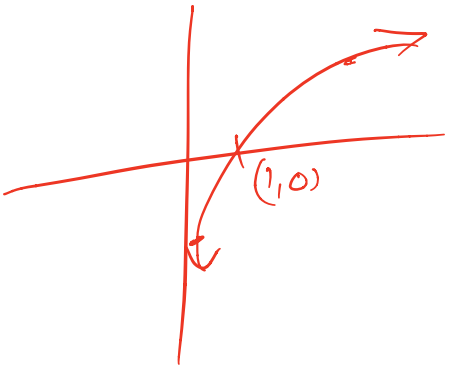


7. $y = \ln(x)$

asymptote $x=0$
key point _____
domain $(0, \infty)$
range $(-\infty, \infty)$

$e^y = x$

x	y
1/e	-1
1	0
e	1



7. Newton's Law of Cooling describes the way the temperature of objects adjusts to the ambient temperature over time. This relationship is an exponential function. Let $H(t) = 93(0.91)^t + 68$ describe the temperature of a beverage (in degrees F) t minutes after a Dunkin' Donuts employee hands it to you.

a. Is the beverage hot coffee or iced coffee? How can you tell by looking at the equation?

b. What is the asymptote of the graph of $H(t)$ and what does it mean in the context of this problem?

c. Sketch a rough graph of $H(t)$. Only do the portion of the function where $t \geq 0$, since the negative values of t don't make sense in the context of the problem.

d. Calculate the coordinates of the y-intercept of $H(t)$. What do they mean in the context of the problem?

e. What is the range of $H(t)$? (remember, only where $t \geq 0$). What meaning does it have in the context of the problem?

f. What is the value of $H(10)$ and what meaning does it have in context?

g. Exactly when does the temperature hit 90°? Solve with logs.

g. Exactly when does the temperature hit 75°? Solve with logs.

(A) graph is decreasing - hot coffee

temperature at 10 min

(B) $y = 68$ (d) 161° (e) (68, 161) (F) $h(10) = 104.215°$

(G) 15.285 min

(G) 27.427 min

Interest Compounded Annually

Suppose that \$10,000 is invested at 6% interest compounded annually.
In **t** years an investment will grow to the amount expressed by the function $S(t) = 10{,}000 \cdot 1.06^t$, where **t** is time (in years). (See the plot in **Figure 1**).

How long will it take to accumulate \$20,000 in the account?

$\frac{20{,}000}{10{,}000} = \frac{10{,}000 \cdot 1.06^t}{10{,}000}$

$2 = 1.06^t$

$\frac{\log 2}{\log 1.06} = \frac{t \log 1.06}{\log 1.06}$

$11.895 \text{ yrs} = t$