Calc BC Summer 3

1. a. 2. d 3. e.

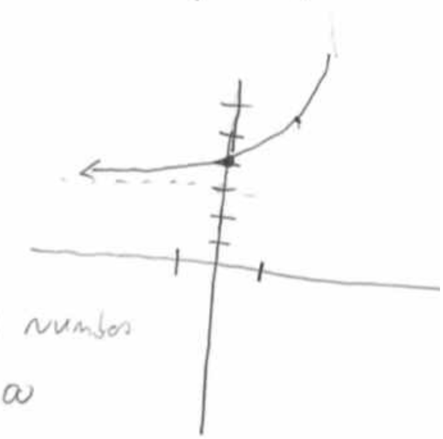
4. c. 5. b. 6. f.

7. $y = -2^x + 3$

Domain: All real numbers

Range: $-\infty < y < 3$

8. $y = e^x + 3$



Domain: all Real numbers

Range: $3 < y \leq \infty$

12. $16^{3x} = (2^4)^{3x} = \boxed{2^{12x}}$

13. $\left(\frac{1}{8}\right)^{2x} = (2^{-3})^{2x} = \boxed{2^{-6x}}$

15. $2^x = 5 \Rightarrow 2^x - 5 = 0$

$\boxed{x \approx 2.322}$

16. $e^x = 4 \Rightarrow e^x - 4 = 0$

$\boxed{x \approx 1.386}$

20. $y = -3x + 4$

x	y	Δy
1	1	
2	-2	-3
3	-5	-3
4	-8	-3

21. $y = x^2$

x	y	
1	1	
		3
2	4	
		5
3	9	
		7
4	16	

24.

Date	Pop	Growth
1890	6250	2.75%

$P(t) = 6250(1.0275)^t$

a)

1915 $P(25) = 12,315$

$P(50) = 24,265$

b)

$P(t) = 50,000 \quad t = 76.651$

about $t = 77$

$1890 + 77 = \boxed{1967}$

25. a) $A(t) = 6.6\left(\frac{1}{2}\right)^{t/14}$

b) $A(t)=1$ when $t \approx 38.115$

1 gram when $t = 38.115$ days

33. $P(t) = 2^{t/.5} = 2^{2t}$

$P(24) = 2^{48} = 2.815 \times 10^{14}$ bacteria

34. Each year is 80% of the previous year

a) $C(t) = 10{,}000\,(.8)^t$

$C(t) = 1000$ when $t = 10.319$ years

b) $C(t) = 1$ when $t = 41.275$ years

36. $B = 100e^{0.693t}$

a) initial present $= 100e^0 = 100$ bacte

b) $B(6) = 100e^{.693(6)} = 6394.351$

about 6394 bactoric after 6 hours

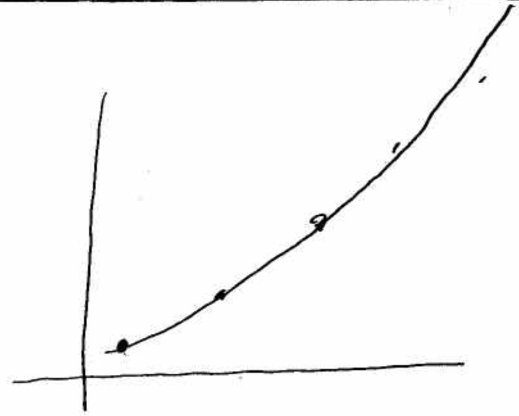
c) $B(t) = 200$ at $t \approx 1.000$

it doubles about every hour

4/4

37. $y = 6.03\,(1.0298)^t$

a)



b) $y(0) = 6.03$

c) $\dfrac{87.574 - 85.037}{85.037} = \dfrac{y(91) - y(90)}{y(90)} \approx 2.98\%$