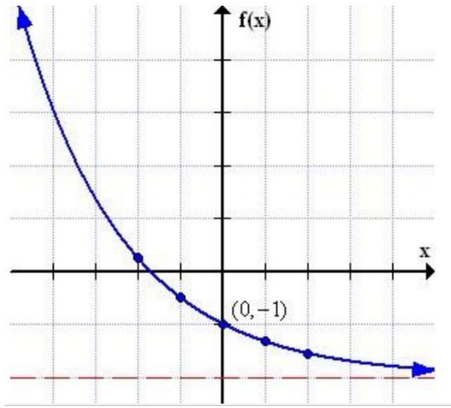
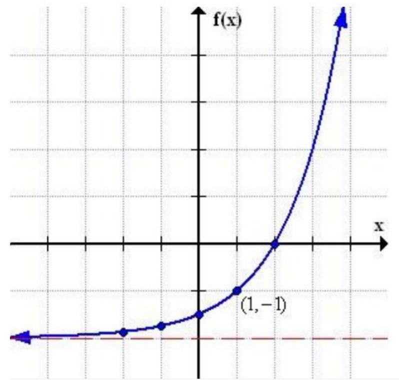
1b)



$$\lim_{x\to\infty} f(x) = -2$$

$$\lim_{x\to-\infty} f(x) = +\infty$$

1c)



$$\lim_{x\to\infty} f(x) = +\infty$$

$$\lim_{x\to-\infty} f(x) = -2$$

2b) Let x = time and y = Temperature

$y = ab^x + 20$

$y = 52b^x + 20$ (because initial Temp. = 72)

$48 = 52b^1 + 20$ (because Temp. = 48 after 1 min.)

$b \approx .53846$

$y = 52(.53846)^x + 20$

So, $y = 22.4$ when $x = 5$

The temperature of the thermometer is 22.4° F after 5 minutes!

2c) let x = time and y = value of the car

$y = ab^x$

$y = 25{,}000b^x$ (when t = 0 car is worth 25,000)

$y = 25{,}000(1-r)^x$ because exponential DECAY

$y = 25{,}000(1-.25)^x$

$y = 25{,}000(.75)^x$

So, when $x = 10$, $y = 1407.84$

The car is worth $1407.84 after 10 years!

Note: "*b*" can also be found by finding its worth a year later(25% of 25,000 which is $18,750). Then, substitute 1 and 18750 for x and y respectively to solve for b.

2d) let x = time and y = value remaining at that time

$$y = a\left(\frac{1}{2}\right)^{x/10.76}$$

$$y = 60\left(\frac{1}{2}\right)^{x/10.76}$$ (when t = 0 there is 60g. present)

So, when $x = 50$, $y = 2.4$

2.4 grams remain after 50 years!