(left margin, vertical) GRAPHING CALCULATOR   GRAPHING CALCULATOR   GRAPHING CALCULATOR   GRAPHING CALCULATOR

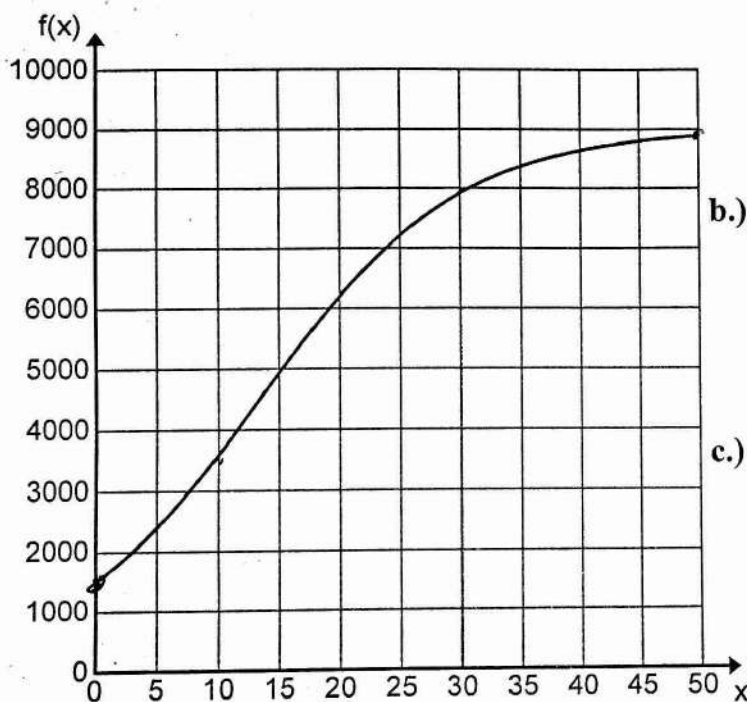**2.** Many animals were declared endangered in the 1960's and 1970's meaning that if nothing changed, the animal was likely to become extinct. Many efforts were taken to prevent animal populations from becomming extinct. The Great Northwestern Spotted Ferret Bat was declared endangered in 1963 and laws were passed to increase habitat and stop pollution. Since then, the Ferret Bat population has gradually increased. Animal researchers determinede that the function $f(x)$ models the Ferret Bat population since 1963 where x represents time (in years since 1963) and y represents the estimated number of Ferret Bats. The graph of $f(x)$ is shown below.

a.) Find the y-intercept of the graph? Explain the meaning in the context of the problem.

> 1500   1963 there
>   was 1500 bats

b.) What is the domain and range?

> $x \geq 0$ $(x \leq 50)$ → optional
> $y \geq 1500$ $(y \leq 8900)$

c.) Estimate $f(10)$ from the graph. Explain the meaning in the context of the problem.

> 3500
> 1973   3500 bats

d.) Estimate when $f(x) = 8000$. Explain the meaning in the context of the problem.

> $x = 30$
> 1993 there were
>   8000 ferret bats

WORK SPACE

$$\frac{8900 - 1500}{50} = \frac{7400}{50}$$

$$= 148$$

e.) Find the average rate of change in the Ferret Bat population over the time interval from $x = 0$ years until $x = 50$ years. Indicate units of measure.

> ← 148 bats/year

f.) From the graph, estimate when the Ferret Bat population was growing the fastest.

> Years 10 - 25
>   1973 - 1988

Intermediate Algebra (A)   Unit 2 Free Response Practice Questions

GRAPHING CALCULATOR   **GRAPHING CALCULATOR**   **GRAPHING CALCULATOR**

3. The United States has a National Debt. This is because our country spends more money than it takes in. The US raises money by selling savings bonds but it also borrows money from other countries. The function $d(t)$ represents the US national debt where t represents time (in years since 1970) and $d(t)$ represents the national debt (in trillions of dollars). The graph of $d(t)$ is shown below.

d(t) vs t graph, axes labeled d(t) from 0 to 20, t from 0 to 45.
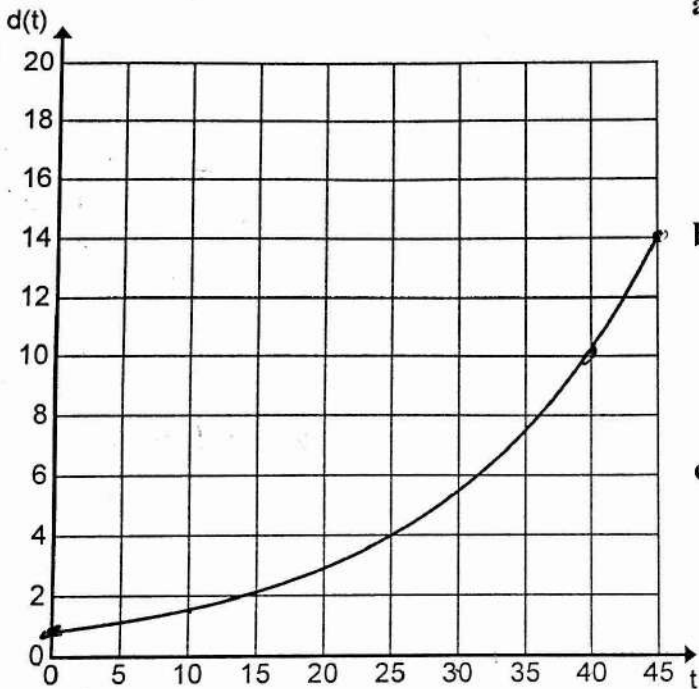
a.) Find the y-intercept of the graph? Explain meaning in the context of the problem

> $y = 1$
> Year 0 debt was
> 1 trillion dollars (1970) debt was 1 tri

b.) Estimate f(10) from the graph. Explain the meaning in the context of the problem.

> $f(10) \approx 1.9$ (1980 debt was 1.9 trillion)
> Year 10 Debt was 1.9 trillion

c.) Estimate when $d(t) = 10$. Explain the meaning in the context of the problem.

> $d(t) = 10$
> $t = 40$
> After 40 years debt is 40 trillion
> 2010 debt is 40 tri

d.) Find the average rate of change in the US debt over the time interval from t = 0 years (1970) until t = 40 years (2010). Indicate units of measure.

> $\frac{1}{5}$ or .2 trillion dollars
> per year

WORK SPACE

$\frac{9 - 1 = 8}{40}$

$\frac{1}{5}$

e.) Is the rate at which the US accumulates debt increasing, decreasing, or remaining constant over time? Explain your reasoning.

> Increasing because the line is curved / getting steeper

f.) In 2003, the US population was 291 million people. If the National Debt in 2003 was divided equally amongst the 291 million people, find each person's "share" of the National Debt.

$\frac{6,000,000,000,000}{291,000,000}$

> $\$20\ 618.56$