Name _____ Date _____ Class _____

TEKS 2A.11.C

LESSON 7-1

Problem Solving

Exponential Functions, Growth, and Decay

Justin drove his pickup truck about 22,000 miles in 2004. He read that in 1988 the average residential vehicle traveled about 10,200 miles, which increased by about 2.9% per year through 1994.

1. Write a function for the average mileage, $m(t)$, as a function of t, the time in years since 1988. _____

2. Assume that the 2.9% increase is valid through 2008 and use your function to complete the table to show the average annual miles driven.

Year	1988	1992	1996	2000	2004	2008
t	0	4				
$m(t)$	10,200					

3. Did Justin drive more or fewer miles than the average residential vehicle driver in 2004? by how much (to the nearest 100 miles)?

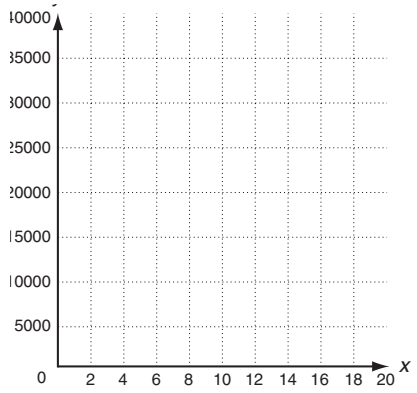
_____

4. Later Justin read that the annual mileage for light trucks increased by 7.8% per year from 1988 to 1994.

a. Write a function for the average miles driven for a light truck, $n(t)$, as a function of t, the time in years since 1988. He assumes that the average number of miles driven in 1988 was 10,200.

_____

b. Graph the function. Then use your graph to estimate the average number of miles driven (to the nearest 1000) for a light truck in 2004.



_____

c. Did Justin drive more or fewer miles than the average light truck driver in 2004? by how much?

_____

Justin bought his truck new for $32,000. Its value decreases 9.0% each year. Choose the letter for the best answer.

5. Which function represents the yearly value of Justin's truck?

A $f(x) = 32{,}000(1 + 0.9)^t$

B $f(x) = 32{,}000(1 - 0.9)^t$

C $f(x) = 32{,}000(1 + 0.09)^t$

D $f(x) = 32{,}000(1 - 0.09)^t$

6. When will the value of Justin's truck fall below half of what he paid for it?

F In 6 years

G In 8 years

H In 10 years

J In 12 years

Name _____ Date _____ Class _____

TEKS 2A.11.C

LESSON 7-1

Problem Solving

Exponential Functions, Growth, and Decay

Justin drove his pickup truck about 22,000 miles in 2004. He read that in 1988 the average residential vehicle traveled about 10,200 miles, which increased by about 2.9% per year through 1994.

1. Write a function for the average mileage, $m(t)$, as a function of t, the time in years since 1988.

$m(t) = 10{,}200(1 + 0.029)^t$

2. Assume that the 2.9% increase is valid through 2008 and use your function to complete the table to show the average annual miles driven.

Year	1988	1992	1996	2000	2004	2008
t	0	4	8	12	16	20
$m(t)$	10,200	11,436	12,821	14,374	16,116	18,068

3. Did Justin drive more or fewer miles than the average residential vehicle driver in 2004? by how much (to the nearest 100 miles)?

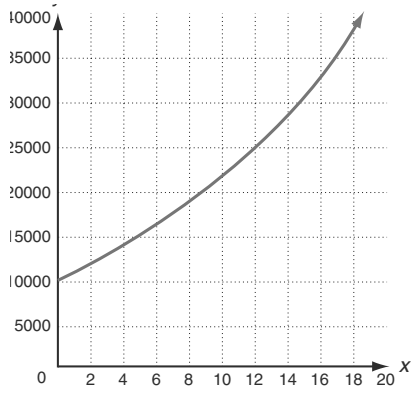
He drove more miles; about 5,900 miles more.

4. Later Justin read that the annual mileage for light trucks increased by 7.8% per year from 1988 to 1994.

a. Write a function for the average miles driven for a light truck, $n(t)$, as a function of t, the time in years since 1988. He assumes that the average number of miles driven in 1988 was 10,200.

$n(t) = 10{,}200(1 + 0.078)^t$

b. Graph the function. Then use your graph to estimate the average number of miles driven (to the nearest 1000) for a light truck in 2004.



About 34,000 miles

c. Did Justin drive more or fewer miles than the average light truck driver in 2004? by how much?

He drove fewer miles than the average light truck driver by about 12,000 miles.

Justin bought his truck new for $32,000. Its value decreases 9.0% each year. Choose the letter for the best answer.

5. Which function represents the yearly value of Justin's truck?

A $f(x) = 32{,}000(1 + 0.9)^t$

B $f(x) = 32{,}000(1 - 0.9)^t$

C $f(x) = 32{,}000(1 + 0.09)^t$

(D) $f(x) = 32{,}000(1 - 0.09)^t$

6. When will the value of Justin's truck fall below half of what he paid for it?

F In 6 years

(G) In 8 years

H In 10 years

J In 12 years