Section 3.3a – Practice Problems

PROFIENT LEVEL QUESTIONS

1. An insurance company purchased computers for its office. The value of the computers after two years was $80 000, and $56 000 after four years. Determine the purchase price of the computers.

Slope is: $/yr

(2, 80 000)

(4, 56 000)

$m = \frac{80\,000 - 56\,000}{2-4} = -12\,000$

$y = -12000x + b$

plug in either (x, y) — Happens at year 0.

$80\,000 = -12000(2) + b$

$80\,000 = -24\,000 + b$

$104\,000 = b$

$104 000

2. In her first year of practice, a psychologist has 160 patients. By the third year, the number of patients grew to 246. IF this trend continues, how many patients will she have in the fourth year?

Slope is $\frac{\text{patients}}{\text{yr}}$

(1, 160)

(3, 246)

$m = \frac{246 - 160}{3 - 1} = 43 \frac{\text{patients}}{\text{yr}}$

$246 + 43 = \boxed{289}$

3. The percent of 18 – 25 year olds who smoke worldwide has changed from 46.8% in 1987, to 37.2% in 2000. Predict the percentage of 18 – 25 year olds that will smoke in 2012.

$m = \frac{\%}{\text{yr}}$

(1987, 46.8%)

(2000, 37.2%)

$m = \frac{46.8 - 37.2}{1987 - 2000} = -0.74\frac{\%}{\text{yr}}$

-0.74% per yr. 12 yrs goes to 2012

decrease of 8.88%

So $37.2 - 8.9 = \boxed{28.3\%}$

4. A taxi cab is purchased for $36 000. At the end of the 10 years, it is sold for scrap for $1800. Find the depreciation equation for the car.

$m = \$/yr$ (0, 36000) (10, 1800) depreciation rate: $\frac{36000 - 1800}{0 - 10} = \$-3420/yr$

$y = -3420x + b$

↑ need this, plug in either (x, y)

$36000 = -3420(0) + b$

$b = 36000$

$y = -3420x + 36000$

5. A home was purchased for $410 000. The owner expects the home to double in value in the next 10 years. Find the appreciation equation of the home.

(0, 410000) ← b (y-int)

(10, 820 000)

$m = \frac{410\,000 - 820\,000}{0 - 10} = \$41\,000/yr$

$V = 41000(yr) + 410\,000$

6. A printer costs $960 new and is expected to be worth $140 after six years. What will it be worth after four years?

(0, 960) ← b

(6, 140)

$m = \frac{960 - 140}{0 - 6} = \$-136.67/yr$

$V = -136.67yr + 960$

plug in $yr = 4$

$V = -136.67(4) + 960$

$V = \$413.33$