Financial Algebra Name: ______________________

CHAPTER 5 APPLICATIONS 285 (2-20 E) Date: ______________________

2. Cost of an add in the paper. 5 lines + photo

\$49	for first 3 lines
\$9.50 × 2	each additional line is \$9.50
\$30	for photo
\$98	

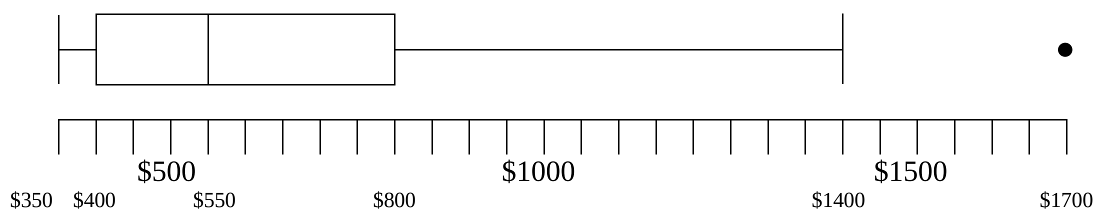
4. Straight line depreciation equation: $y = -mx + b$
   - y = value at some time in the future
   - m = amount car depreciates each year
   - x = number of years since car was new
   - b = cost of the new car

   For a car: $y = -2{,}400x + 36{,}000$
   a. Original price of car? \$36,000 = b
   b. Value lost per year? \$2,400 = m
   c. Years till total depreciation? 15 =

   $$0 = -2{,}400x + 36{,}000$$
   $$2{,}400x = 36{,}000$$
   $$x = 36{,}000 / 2{,}400$$
   $$= 15 \text{ years}$$

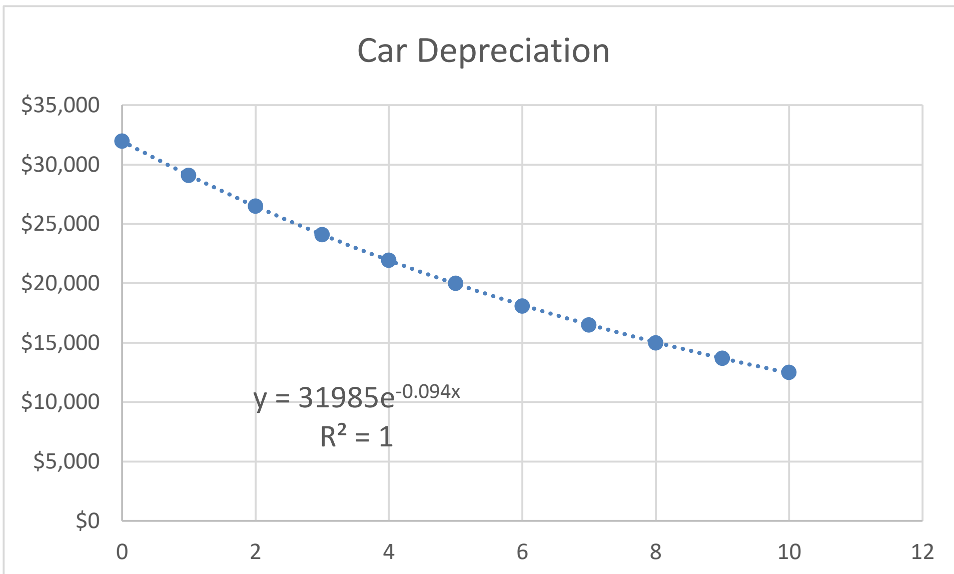
6. Prices for used '57 Chevy side trim (based on condition)
   \$350, \$350, \$390, \$400, \$500, \$500, \$500, \$600, \$650, \$725, \$800, \$850, \$900, \$1,700
   ↑ ↑ ↑

   a. Mean to nearest dollar — \$658 = sum / 14 = 9,215 / 14 = \$658.21
   b. Median — \$550 = (500 + 600) / 2
   c. Mode — \$500 = the price that occurs most, \$500 = 3 times
   d. The four quartiles (arrows above) — Q1 = \$400, Q2 = \$550, Q3 = \$800, Q4 = \$1,700
   e. Find the interquartile range — \$400 = Q3 – Q1 = \$800 – \$400 = \$400
   f. Lower outlier boundary, outlier? — –\$200 = Q1 – 1.5(IQR) = \$400 – 1.5(\$400) = –\$200
      No lower outliers.
   g. Upper outlier boundary, outlier? — –\$200 = Q3 + 1.5(IQR) = \$800 – 1.5(\$400) = \$1,400
      One upper outliers, \$1,700
   h. Box and whisker plot



8. From stem and leaf plot
   a. Number of teachers polled 25
   b. Mean (to nearest mile) 40. = SUM / 25 = 998 / 25 = 39.92
   c. Median 38
   d. Modes 19, 20, 36, 37, 55, 59, 62 all occur twice
   e. Range 51 = (62 – 11) = 51
   f. The four quartiles Q1 = 21.5 (20, 23), Q2 = 38, Q3 = 57 (56, 58), Q4 = 62
   g. % > 38 miles 48% = (12 / 25) × 100 = 48%
   h. 38 < % < 57 28% = (7 / 25) × 100 = 28%

10. Depreciation chart analyzed using Excel
   a. Scatterplot with polynomial and R^2 factor



   b. Determine exponential formulas $y = 31{,}985(1 - 0.094)^x$
   c. Determine depreciation (nearest %) = 9% (to the nearest whole percent)
   d. Use model to find value at 66 months $= 32{,}000(1 - 0.09)^{5.5}$ = $19,049 or $19,000

12. 4 year old car costs $12,000, depreciates exponentially by 5.8% per year. Find new car cost to the nearest $100.

$y = A\,(1 - r)^x$

y = value at some time in the future
A = cost of the new car
r = rate (as a decimal)
x = number of years since car was new

$12,000 $= A\,(1 - 0.058)^4$
A = $12,000 / $(1 - 0.058)^4$
= $12,000 / $(0.942)^4$
= $15,239.74
= $15,200 (to the nearest $100)

Go on to the next page.

14. Jon's car gets 25 mpg. He plans a 980 mile trip.
   a. How many gallons for the trip? 39.2 = 980 mi / 25 mi gal^{-1} = 39.2 gallons
   b. Cost of the trip (nearest $10)? $160 = 39.2 gal × $4.00 gal^{-1} = $156.80 = $160

16. Reaction distance at 42 mph and 0.75 sec.

   For 0.75 sec, the reaction distance is about 1 ft per mph.
   42 ft.

18. At 65 km/h, can you stop in 30 m if reaction time is 0.75 sec?

   $SD = (s^2 / 170) + (s / 5)$ SD = total stopping distance and s = speed in kph
   $= (65^2 / 170) + (65 / 5)$
   $= 24.85 + 13$
   $= 24.9$ m The car can stop in time.

20. Find average skid length for a car traveling 52 mph if the drag factor is 1.05 and brakes are at 80% efficiency.
   $S = (30 \times D \times f \times n)^{½}$
   S = speed
   D = average skid length
   f = drag factor
   n = brake efficiency

   $52 = (30 \times D \times 1.05 \times 0.80)^{½}$
   $52^2 = 25.2 \times D$
   $D = 52^2 / 25.2$
   $= 107.3$ ft

This is the last page.