Ratios, Proportions & Percents

1.
John's car is 14 feet long. He is making a model that is $\frac{1}{8}$ of the actual size. Which proportion below should be used to find the length, L, of the model?

Write your response here:
(show your work)

2. What is 34.4% of 9,372?

Write your response here:
(show your work)

3. Jill's father bought Jill a car with the understanding that she would pay the car off in three years by making equal monthly installments. The car cost her father $4000 plus 7% sales tax. How much are the monthly payments Jill must make to her father?

Write your response here:
(show your work)

4. Jim takes out an interest-only loan for $4,258. The length of the loan is two years and the interest rate is 6% over the life of the loan. If the interest payments are divided evenly over the two years, what will Jim's payments be each month?

Write your response here:
(show your work)

5. The chart below shows the number of students who work part time jobs, and how many hours per week they work. The principal has decided that all students who work 20 hours or more per week are eligible for early dismissal. What percentage of the students in the chart below are eligible for early dismissal?

Group A	Group B	Group C
25 hrs	17 hrs	32 hrs
52 students	61 students	60 students

Write your response here:
(show your work)

Answers

1. $\dfrac{L}{14} = \dfrac{1}{8}$

2. 3,223.968

3. $118.89

4. $10.65

5. 65%

Explanations

1. The model is $\dfrac{1}{8}$ of the actual size. So, the ratio of the length of the model, L, to the length of the car, 14 ft, equals $\dfrac{1}{8}$.

   Write this as a proportion.

   $$\dfrac{L}{14} = \dfrac{1}{8}$$

2. Convert the percentage to a decimal.

   34.4% is equivalent to 0.344

   Multiply.

   $0.344 \times 9{,}372 =$ **3,223.968**

3. Calculate the total cost of the car, including sales tax, by multiplying the cost of the car ($4000) by the rate of sales tax (0.07), and then adding this amount to the cost of the car ($4000).

   $$\$4000 + (\$4000 \times 0.07) = \$4280$$

Divide by the number of payments in three years (36).

$$\frac{\$4280}{36} = \$118.89$$

Therefore, Jill's monthly payments to her father are **$118.89**.

4. Calculate the amount of interest for the loan by multiplying the principal × rate × time.

   The amount borrowed is $4,258, and the interest rate is 6%. Since the interest is calculated over the life of the loan, the term for this loan is 1 loan period.

$$\$4258 \times 0.06 \times 1 = \$255.48$$

   Divide the amount of the interest ($255.48) by the number of months in the time period (24).

$$\frac{\$255.48}{24} = \$10.65$$

   Therefore, Jim's payments each month will be **$10.65**.

5. Determine the total number of students in the chart.

$$52 + 61 + 60 = 173 \text{ students}$$

   Determine the eligible students who work 20 hours or more per week.

   Group A (52 students) + Group C (60 students) = 112 eligible students

   Convert to a fraction the eligible students and total students.

$$\frac{112}{173}$$

   Convert to a decimal for percentage by dividing the number of students who work more than 20 hours per week (112) by the total number of students (173).

$$\frac{112}{173} = 0.6474$$
$$\approx 65\%$$

   Therefore, **65%** of the students are eligible for early dismissal.