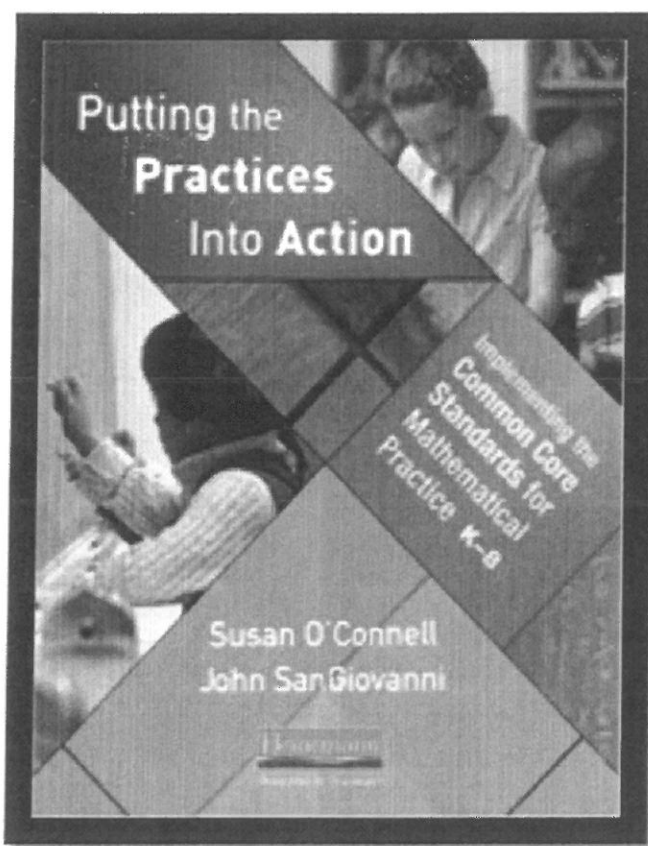


2013 Fall RESA
Secondary Mathematics

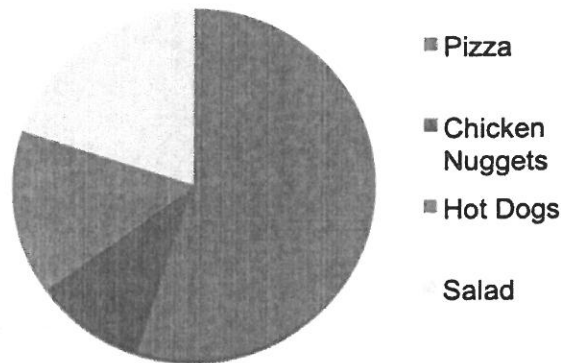
“Putting the Practices Into Action”



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What's For Lunch?

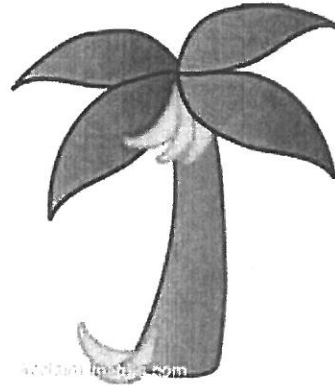


There were 420 students who ate lunch in the cafeteria. Their lunch choices were 55% pizza, 20% salad, 15% hot dogs, and 10% chicken nuggets.

1. Each plate of chicken nuggets was served with three carrot sticks. How many carrot sticks were needed? Explain how you got your answer.
2. How many more students ordered salad than hot dogs? Explain how you got your answer.
3. One-third of the pizza orders were for pepperoni pizza and $\frac{2}{3}$ were for sausage pizza. How many orders were for each kind? Explain how you got your answer.
4. Two-thirds of the students who ordered a hot dog took a ketchup packet, $\frac{1}{7}$ took a mustard packet, and the rest took one of each. How many ketchup packets and how many mustard packets were taken that day? Explain how you got your answer.
5. The cafeteria orders packages of lettuce to make the salads. Each package holds 2 pounds of lettuce. Each salad was made with approximately 10 ounces of lettuce. How many packages of lettuce were needed that day? Explain how you got your answer.

Corey the Camel

(From IMP Year I)

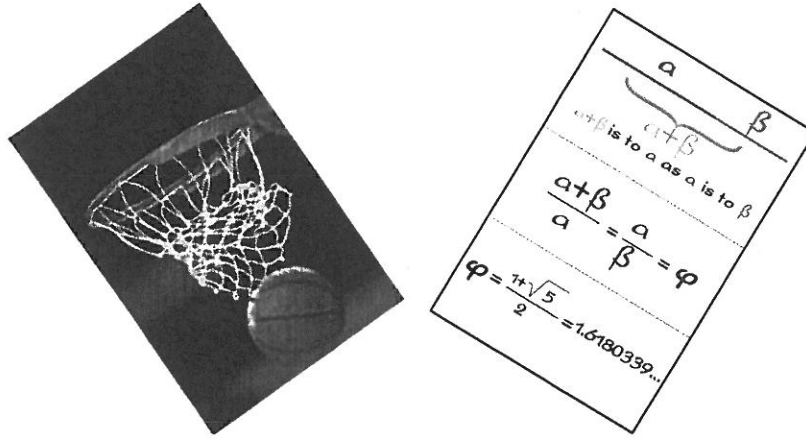


Consider the case of Corey the Camel – the enterprising but eccentric owner of a small banana grove in a remote desert oasis. Corey's harvest, which is worth its weight in gold, consists of 3000 bananas. The marketplace where the harvest can be sold is 1000 miles away.

Corey must walk to the market but she can carry at most 1000 bananas at a time. Furthermore, being a camel, Corey eats one banana during each an every mile she walks (so Corey can never walk anywhere without bananas)

How many bananas can Corey get to the market?

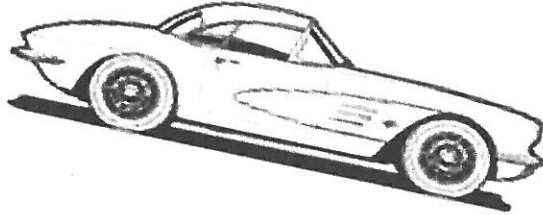
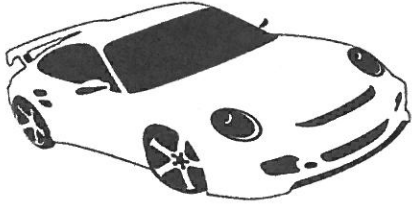
Shooting Free Throws, Probability, and the Golden Ratio



Paige Turner, the star of the Bugtussle High School basketball team, has been fouled and now faces a one-and-one situation. If she makes the first free throw, she gets to shoot a second free throw. If she misses the first free throw, she does not get to shoot a second one. For this season, Paige's free-throw shooting percentage is 60%. What do you think is the most likely outcome for Paige's one-and-one free-throw situation – scoring 0 points, 1 point, or 2 points for her team?

1. Would the same result hold if Page's season free-throw shooting percentage was greater than or less than 60%?
2. For what range of Paige's shooting percentage would 2 points be the most likely outcome? For what range would 1 point be the most likely outcome? 0 points?

Buying A Car

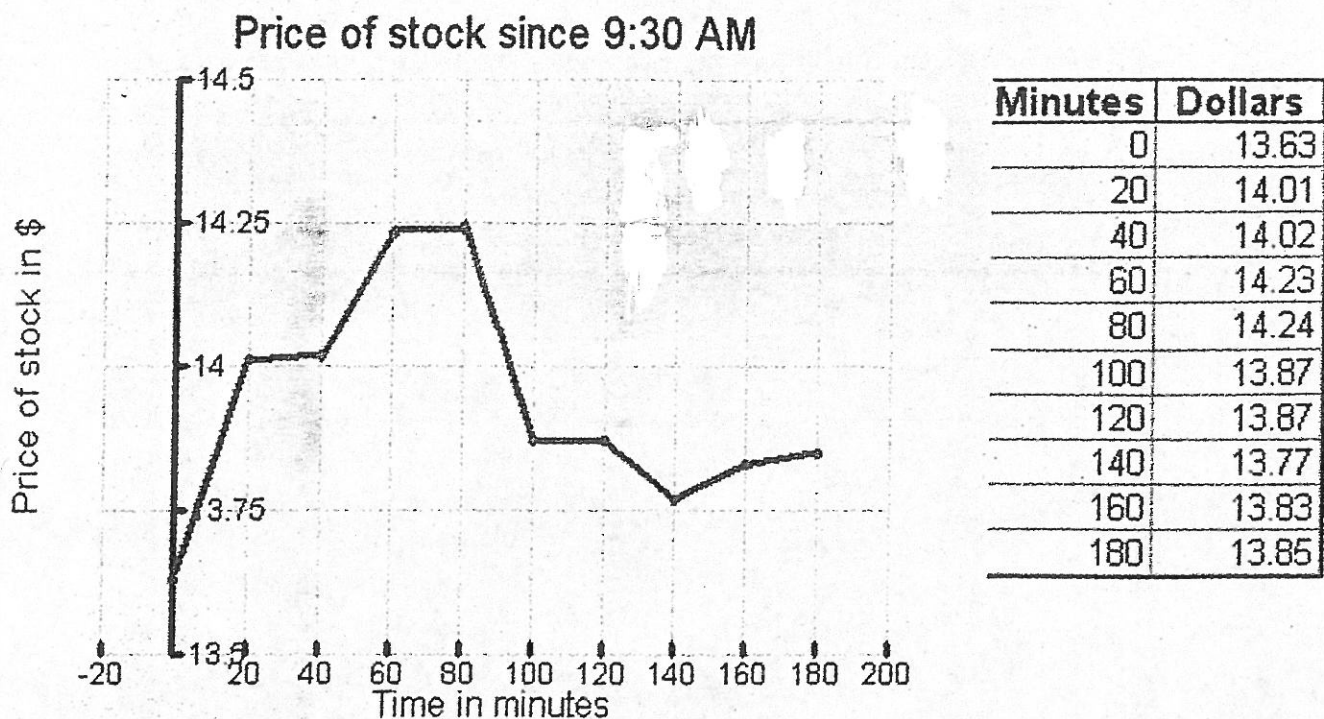


Car	Cost	MPG	Estimated Repairs
Car A	\$3200	18	\$700
Car B	\$4700	24	\$300

Tony is buying a car. He will choose between two cars. The table and the bullets below provide information about each car. Calculate and explain which car will cost Tony the least to buy and use.

- Tony estimated he will drive at least 200 miles per month.
- The average cost of gasoline per gallon in his area is \$3.70.
- Tony plans on owning the car for 4 years.

Price of Stock



Let $f(x)$ be the function defined as the price of stock in dollars at a given time in minutes since 9:30 a.m. The graph of $f(x)$, consisting of nine line segments, is shown above.

- Find the rate of change over the following intervals for x and interpret the meaning of the rate of change in the context of the problem.
 - $[0, 20]$
 - $[40, 60]$
 - $[80, 100]$
 - $[120, 140]$
- On which interval(s) of x is $f(x)$ the steepest? What is the meaning of the steepness of the graph in the context of the problem?
- Are the steepness and rate of change of $f(x)$ the same on any intervals of x ? What is the difference between rate of change and steepness?

The Dog Pen Problem



Suppose that you had 64 meters of fencing with which to build a rectangular pen for your large dog.

1. What are the dimensions of the different pens that can be made using all the fencing?
2. What dimensions are best to allow the most space for the dog to run? Why?
3. What dimensions will allow the most play area? What dimensions allow the least play area? Why?
4. Which rectangular pen has the largest area? Does your result hold for any length of fence? Explain.
5. What about pens that are not rectangular, do any of them have a larger area? Explain.
6. If x is either the length or the width and $f(x)$ is the area, what does the graph of $f(x)$ look like? Use two different arguments to support your reasoning.