

Names:

High School:

Group Work (9th and 10th grades) Nov. 11, 2009

Time: 40 Minutes

1. A whale's head is 72 in. long; its tail is as long as its head plus half the length of its body, and its body is half its entire length. How long is the whale?
2. At a resort eight people rented a motor boat. If four more people shared the cost, each person would have paid \$1 less. How much did each person have to pay?

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3. A piece of wire is 54 ft. long. It is cut into two pieces, each of which is bent to form a square. The total area of the two squares is 103.625 sq. ft. How much longer is a side of the larger square longer than a side of the smaller square?
4. Melissa is driving her hybrid along I-80 at a constant speed of 55 MPH. A sports car that is initially $\frac{1}{2}$ mile behind her is moving at a constant speed as well, and passes her 60 seconds later. How many miles per hour is the sports car traveling at?

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5. Find the sum

$$1 + 2 + 3 + 4 + \cdots + 999 + 1000$$

6. Find three positive integers that form a geometric progression if their sum is 21 and the sum of their reciprocals is $\frac{7}{12}$.

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7. Two candles of equal length start burning at the same time. One of the candles will burn in four hours, and the other in five hours. How long will they have to burn before one candle is three times the length of the other?

8. If

$$x + y + z = 0$$

show that

$$x^3 + y^3 + z^3 = 3xyz.$$