

- 1) If  $n = \frac{1}{2}$ , what is the value of:

$$n^2 + \frac{2}{n} + 3 \times (2 + n)$$

? Express your answer as an improper fraction.

- 2) The sum of the ages of Angelica, Christopher, and Stefan is 63. They are too shy to say their exact ages, but they tell you that Christopher is twice Angelica's age, and Stefan is twice Christopher's age. How many years old is Christopher?
- 3) A box of Goldfish crackers says that 52 Goldfish contains exactly 160 calories. The average man is recommended to consume 2,000 calories per day. How many Goldfish would you have to eat to have consumed 2,000 calories?
- 4) Suppose that each year, a used car will lose 7% of its value (the value that the car had at the beginning of that year). If you bought a used car for \$15,000, in how many years will the car first be worth less than half of what it originally cost? Express your answer to the nearest year.
- 5) It is the final day of school, and Harvey wants to match or beat Gretta's impressive winning percentage on Hangman. Gretta, who is absent on the last day of school, had previously won 237 out of her 322 games. Harvey has played a total of 270 games so far and will be playing 20 more games today. If he has won 194 out of his 270 games so far, how many games out of the 20 that he plays today will he have to win in order to match or beat Gretta's winning percentage?
- 6) What is the sum of the terms in the sequence:  
1, -2, 3, -4, 5, -6, . . . , -248, 249  
?
- 7) If a never-resting bunny that happened to run on never-ending batteries were to move at the rate of 1.5 inches per second, how many miles would it move over the course of an entire 365-day year? Express your answer to the nearest mile.
- 8) Three friends – Aaron, Betty, and Carmen – are at a carnival. In pairs, they take turns stepping onto a scale. Aaron and Betty weigh 156 pounds together, Betty and Carmen weigh 164 pounds together, and Aaron and Carmen weigh 152 pounds together. How many pounds do the three friends weigh in total?

**BONUS PROBLEMS**

- 9) Last year, a retail store had an item on sale for 30% off its original price. The item, now with a new original price, went on sale for 40% off, which brought it to the same price as when it was on sale the year before. By what percent did the item's original price increase between last year and this year? Express your answer to the nearest percent.
- 10) Suppose that a rental car has a base cost plus a fee per mile the car is driven. At the beginning of the day, Brian and Betty both rented the same car for the same base cost and the same mileage fee. Brian wanted to show off his car, so he drove 240 miles and ended up paying \$166. Betty was worried she would damage the car, so she only drove 50 miles, and ended up paying \$90. How much was the base cost of the car in dollars?
- 11) Peter agreed to work after school for 8 weeks at a fixed weekly rate. But instead of being given only money, he was to be given \$85 and a bicycle. However, Peter worked only 5 weeks at the fixed weekly rate and was given \$25 and the bicycle. How much was the bicycle worth?
- 12) Two cars drive toward each other from opposite ends of a highway 767 miles long. The speed of the first car is 56 miles per hour. The speed of the second car is 62 miles per hour. The cars will meet after how many hours of driving?

**Solutions**

- 1)  $\frac{47}{4}$
- 2) 18 years old
- 3) 650 Goldfish
- 4) 10 years
- 5) 20
- 6) 125
- 7) 747 miles
- 8) 236 lbs
- 9) 17%
- 10) \$70
- 11) \$75
- 12) 6.5 hours