

# Heart of Algebra Drill 3

For each question in this section, solve the problem and circle the letter of the answer that you think is the best of the choices given.

- Andy runs and eats breakfast every morning before work. When he runs, he burns 160 calories per mile for the first 3 miles. When he runs more than 3 miles, he burns 98 calories per additional mile. On Tuesday morning, Andy runs an additional  $x$  miles over 3 miles and then consumes  $y$  calories for breakfast. Which of the following functions,  $f$ , models the net number of calories Andy has lost after running and eating breakfast on Tuesday morning?
  - $f(x, y) = 98x - y$
  - $f(x, y) = 160x + 98x - y$
  - $f(x, y) = 480 + 98x + y$
  - $f(x, y) = 480 + 98x - y$
- Sheila walks dogs on the weekend for extra income. For every dog she walks, she charges a flat rate of \$20.00 for the first hour. For every additional minute of walking a dog, she charges an additional fee. If Sheila is asked to walk a dog an additional  $a$  minutes after the first hour, and she charges  $b$  dollars per additional minute, which of the following functions,  $d$ , models how much she will earn in terms of  $a$  and  $b$ ?
  - $d(a, b) = 20 + a + b$
  - $d(a, b) = 20ab$
  - $d(a, b) = 20 + ab$
  - $d(a, b) = 20 + 2(ab)$
- Sam saved his money until he had \$10,000 to invest. He invested  $x$  dollars into a certificate of deposit (CD) with an annual interest rate of 2.0%, and the remaining  $y$  dollars into a mutual fund with an annual interest rate of 1.5%. If his total interest earned from both accounts after one year was \$193 dollars, which of the following is the value of  $y$ ?
  - \$9,807
  - \$8,600
  - \$1,400
  - \$350
- Hap is driving on the highway when his gasoline tank begins to leak. When he has one gallon left in his tank, he finds a gas station to pump more gas into the tank. As he pumps, he loses one-fourth of a gallon every ten minutes. If he pumps  $g$  gallons of gas over a period of  $m$  minutes, which of the following models the total amount of gas, in ounces, he has in his tank? (Note: 1 gallon = 128 ounces)
  - $f(g, m) = 128(g) + g + m(g)$
  - $f(g, m) = 128 + 128(g) - 32\left(\frac{m}{10}\right)$
  - $f(g, m) = 128 + 128(g) - 128\left(\frac{m}{10}\right)$
  - $f(g, m) = 1 + g - 32\left(\frac{m}{10}\right)$

5. An airplane flies at a constant altitude of 40,000 feet above sea level. As it starts to land, it descends at a constant rate of  $x$  feet per minute. At what altitude is the plane  $y$  minutes after it begins to descend?

- A)  $f(x, y) = 40,000 - xy$   
B)  $f(x, y) = 40,000 - 60xy$   
C)  $f(x, y) = 40,000 - x - y$   
D)  $f(x, y) = 40,000 - 60x - y$

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6. Sara has a jar filled with 135 coins, which consist only of quarters and nickels. If Sara has a total of \$22.75 in the jar, which of the following is the number of nickels Sara has in the jar?

- A) 25  
B) 55  
C) 80  
D) 130