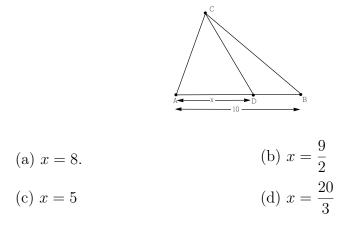
2014 Leap Frog Relay Grades 9-10 Part I

No calculators allowed Correct Answer = 4, Incorrect Answer = -1, Blank = 0

- 1. The sum of the prime divisors of 2014 is
 - (a) 76 (b) 78
 - (c) 80 (d) 82
 - (e) None of these

2. In $\triangle ABC$, the base length AB is 10 feet and the length AD is x feet. What is the value of x so that the area enclosed by $\triangle ADC$ is twice the area enclosed by $\triangle BDC$?

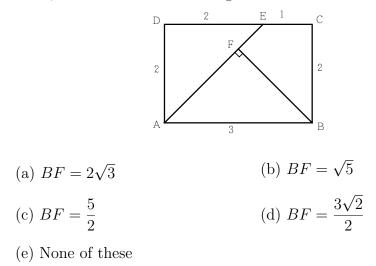


- (e) None of these
- 3. The Antarctic Shoe Store is running a 30% off sale. Sales tax is 10%. The pre-sale price of a pair of shoes is \$78. When you pay for your pair of shoes, you hand the cashier a \$100 bill. How much change do you get back?

(a) \$39.82	(b) \$39.86
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- (c) 39.90 (d) 39.94
- (e) None of these
- 4. A cube of ice has melting so that its surface area has decreased by 19%. Assuming at all times, the cube maintains length = width = height, by what percentage has the volume decreased?
 - (a) 26.7% (b) 26.9%
 - (c) 27.1% (d) 27.3%
 - (e) None of these

- 5. The 9-digit number N = 1234d4321 is divisible by 9. What is the value of the digit d?
 - (a) 7 (b) 6
 - (c) 5 (d) 4
 - (e) None of these
- 6. In the figure below ABCD is a rectangle with indicated side lengths. Also, $\overline{BF} \perp \overline{AE}$. Find the length of BF.



7. Find the value of a so that the two lines 2013x + 2012y = 1 and 2014x + ay = 1 are mutually perpendicular.

(a) $-\frac{2027091}{2000000000000000000000000000000000000$	(b) $-\frac{2027091}{10000000000000000000000000000000000$
(a) = 1009	(0) = 1008
(a) 2027091	(J) 2027091
(c) $-\frac{1007}{1007}$	(d) $-\frac{2021001}{1006}$

(e) None of these

- 8. A standard calendar year has 365 days. A leap year has 366 days. A year is a leap year if it is divisible by 4, *except* if it is a new century year not divisible by 400. So 1900 was not a leap year (1900 *is not* divisible by 400), but 2000 was a leap year (2000 *is* divisible by 400). December 25, 2013 was a Wednesday. What day of the week will December 25 be in the year 3013?
 - (a) Friday (b) Saturday
 - (c) Sunday (d) Monday
 - (e) None of these
- 9. Lenny asks Rodney to choose a number. Lenny then doubles Rodney's number and subtracts 6. Lenny repeats this procedure 2 more times (for a total of 3 times) using the result of the previous calculation as the starting number with each repeat. Lenny then notes that the end result is the number 2014. What was Rodney's starting number?
 - (a) 253 (b) 254
 - (c) 255 (d) 256
 - (e) None of these
- 10. Lenny has 45 coins (nickels, dimes and quarters) in his purse that add up to \$4. The Magic Fairy instantly switches the respective numbers of nickels and quarters, doubling the amount of money in Lenny's purse, giving him \$8. How many quarters did Lenny originally have?
 - (a) 8 (b) 7
 - (c) 6 (d) 5
 - (e) None of these