UNIT 14 EXERCISES 6-10

ALGEBRA

2011A

6. The players on a basketball team made some three-point shots, some two-point shots, and some one-point free throws. They scored as many points with two-point shots as with three-point shots. Their number of successful free throws was one more than their number of successful two-point shots. The team's total score was 61 points. How many free throws did they make?

(A) 13   (B) 14   (C) 15   (D) 16   (E) 17

1999

7. What is the largest number of acute angles that a convex hexagon can have?

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6

2002B

7. The product of three consecutive positive integers is 8 times their sum. What is the sum of their squares?

(A) 50   (B) 77   (C) 110   (D) 149   (E) 194

2008B   7. For real numbers a and b, define $a\$b = (a - b)^2$. What is $(x - y)^2\$(y - x)^2$?

     (A) 0 **(B)** $x^2 + y^2$ **(C)** $2x^2$ **(D)** $2y^2$ **(E)** $4xy$

2014B   7. For how many positive integers n is $\frac{n}{30-n}$ also a positive integer?

     (A) 4 **(B)** 5 **(C)** 6 **(D)** 7 **(E)** 8

2006A   8. How many sets of two or more consecutive positive integers have a sum of 15?

     (A) 1 **(B)** 2 **(C)** 3 **(D)** 4 **(E)** 5

2005A   8. Let $A, M,$ and C be digits with

$$(100A + 10M + C)(A + M + C) = 2005.$$

What is A?

     (A) 1 **(B)** 2 **(C)** 3 **(D)** 4 **(E)** 5

2013A   8. Given that x and y are distinct nonzero real numbers such that $x + \frac{2}{x} = y + \frac{2}{y}$, what is xy?

     (A) $\frac{1}{4}$ **(B)** $\frac{1}{2}$ **(C)** 1 **(D)** 2 **(E)** 4

2014B 8. In the addition shown below A, B, C, and D are distinct digits. How many different values are possible for D?

$$
\begin{array}{r}
ABBCB \\
+ \quad BCADA \\
\hline
DBDDD
\end{array}
$$

(A) 2   (B) 4   (C) 7   (D) 8   (E) 9

2010B 9. Let n be the smallest positive integer such that n is divisible by 20, n^2 is a perfect cube, and n^3 is a perfect square. What is the number of digits of n?

(A) 3   (B) 4   (C) 5   (D) 6   (E) 7

2006A 10. For how many real values of x is $\sqrt{120 - \sqrt{x}}$ an integer?

(A) 3   (B) 6   (C) 9   (D) 10   (E) 11

2013A 10. Let S be the set of positive integers n for which $\frac{1}{n}$ has the repeating decimal representation $0.\overline{ab} = 0.ababab\ldots$, with a and b different digits. What is the sum of the elements of S?

(A) 11   (B) 44   (C) 110   (D) 143   (E) 155

2015A 10. Integers x and y with $x > y > 0$ satisfy $x + y + xy = 80$. What is x?

(A) 8   (B) 10   (C) 15   (D) 18   (E) 26