

*Section A. Each correct answer is worth 1 point.*

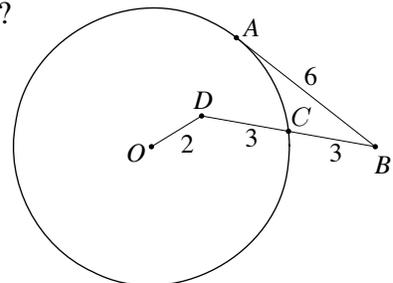
- Evaluate:  $2^0 + 0^6$
- The perimeter of a rectangle is 2006 inches. Its length is 800 inches. What is its width?
- Express in simplest form:  $\frac{1}{10} - \frac{1}{15} + \frac{1}{20} - \frac{1}{30} + \frac{1}{40}$
- Evaluate and write the answer in scientific notation:  $(280 \times 10^6) \div (7 \times 10^3)$
- How many of these numbers are not divisible by 9? 27, 90, 108, 792, 162, 2006, 5445
- Evaluate:  $12 + 3 \times 4 - 6 + 8$
- The divisor is 11, the quotient is 3, and the remainder is 4. What is the dividend?

*Section B. Each correct answer is worth 2 points.*

- Which one of the following expressions is not equal to the other four?  
 A)  $3x(x+2)(x-1)$     B)  $-(1-x)(3x^2+6x)$     C)  $3(x^3+x^2-2)$   
 D)  $(x+2)(3x^2-3x)$     E)  $-6x+3x^2+3x^3$
- Express as a fraction in simplest form:  $0.\overline{123}$
- Factor completely:  $ax - by - bx + ay$
- The degree measure of an angle of a regular polygon cannot be  
 A) 60    B) 75    C) 90    D) 120    E) 135
- Write in simplest form as an exponential expression with a single base:  $3^{3x} \cdot 3^{2(x+1)}$

*Section C. Each correct answer is worth 3 points.*

- If  $(x^3 + 3x - 2)$  is divided by  $(x^2 - 2)$ , what is the remainder?
- Express as a single radical in simplest form:  
 $(\sqrt{2})(\sqrt[3]{5})$
- (See figure).  $\overline{AB}$  is tangent to  $\odot O$  at  $A$ . If  $BC = 3$ ,  $CD = 3$ ,  $OD = 2$ , and  $AB = 6$ , find the length of the radius of  $\odot O$ .



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*Section A. Each correct answer is worth 1 point.*

1. Evaluate:  $4^5 - 5^4$
  2. The area of a triangle is 2006 sq. cm. Its base is 2006 cm. What is its height?
  3. If  $\frac{2}{5}$  of a number is 2.5, what is the number?
  4. Find the sum of  $x$  and  $y$  if  $3x = 90$ , and  $3y = x$ .
  5. Find the measure (to the nearest degree) of the acute angle whose tangent is 1.732050808.
  6. The average of 11 numbers is 121. When one number is dropped, the average of the remaining set of numbers is 120. What number was dropped?
  7. Give an example of two numbers such that their product is positive, and their sum is negative.
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*Section B. Each problem is worth 2 points.*

8. Take a three-digit number ending in 1, say  $ab1$ . The sum of the digits,  $a + b + 1$ , is a two-digit number,  $cd$ . The product of those digits,  $c \cdot d$ , equals 8. List all possible values for the original number.
  9. A single die (number cube) is tossed three times. What is the probability that all three numbers are the same? Express as a ratio in simplest form.
  10. Doc Math chose a two-digit number. He subtracted it from 300 and doubled the result. Then he added the original two-digit number to this result. What is the largest number that Doc Math could get?
  11. While driving, Dale Jr. noticed that his car's odometer reading, 47974 miles, was a palindrome (reads the same forward as backward). Dale Jr. continued driving, and two hours later the odometer showed the next possible palindrome. What was the average speed of his car during those 2 hours (in mph)?
  12. Find the largest integer  $n$  for which  $10^n$  is a factor of  $(8^4)(200^6)(15^{13})$ .
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*Section C. Each problem is worth 3 points.*

13. In a set of ten whole numbers, the minimum number is 62, the range is 25, and the median is 82. Find the smallest and largest possible values for the mean of that set of numbers (given to the nearest tenth).
14. Given a triangle with sides 6, 7, and 9 units, write the length of the altitude to the shortest side. The answer may be exact, or to the nearest hundredth.
15.  $\log_{16}(\log_2(\log_3 x)) = \frac{1}{4}$ . Write the value of  $x$ .