

Name: _____ Team Name: _____

Progress Assessment Test (PAT) Directions:

This test is to be taken individually, and is used as a mathematics assessment. No calculators are allowed. Each question is worth 10 points. **You have 30 minutes to complete problems 1-15.** (Show all of your work).

Problem 1. For all values of x , $(3x-4)(4x-3)=$

- (a) $7x+1$
- (b) $7x-12$
- (c) $12x^2-12$
- (d) $12x^2-25x-12$
- (e) $12x^2+7x-12$

Problem 2. In a certain set of numbers, the ratio of integers is 2:3. What percent of the numbers in the set are integers?

- (a) 20%
- (b) $33\frac{1}{3}\%$
- (c) 40%
- (d) 60%
- (e) $66\frac{2}{3}\%$

Problem 3. What is the y -intercept of the line with the equation $2x-3y = 18$?

- (a) -9
- (b) -6
- (c) -3
- (d) 6
- (e) 9

Problem 4. In the sequence 2, 6, 18, x , 162..., what is the most likely value of x ?

- (a) 36
- (b) 48
- (c) 54
- (d) 81
- (e) 98

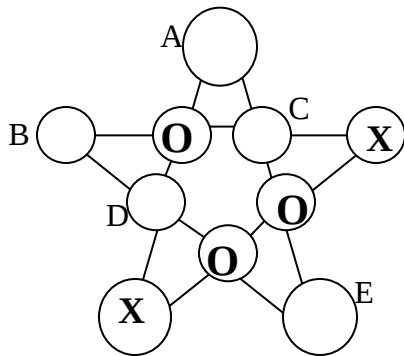
Problem 5. There are 3 routes from Bay City to Riverville. There are 4 routes from Riverville to Straitstown. There are 3 routes from Straitstown to Frog Pond. If a driver must pass through Riverville and Straitstown exactly once, how many possible ways are there to go from Bay City to Frog Pond?

- (a) 6
- (b) 10
- (c) 12
- (d) 24
- (e) 36

Problem 6. In a list of seven integers, 13 is the lowest member, 37 is the highest member, the mean is 23, the median is 24, and the mode is 18. If the numbers 8 and 43 are then included in the list, which of the following will change?

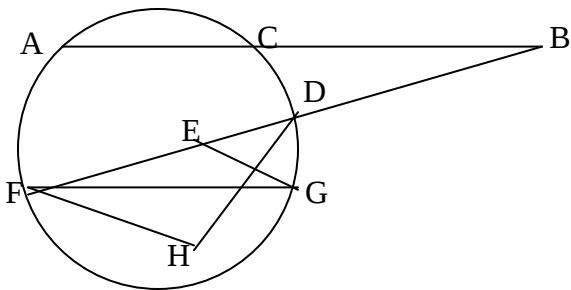
- I. The Mean
 - II. The Median
 - III. The Mode
-
- (A) I only
 - (B) I and II only
 - (C) I and III only
 - (D) II and III only
 - (E) I, II, and III

Problem 7. If the figure below is filled in so that each row of four circles contains two circles marked with an X and two circles marked with an O, which circle must be marked with an X?



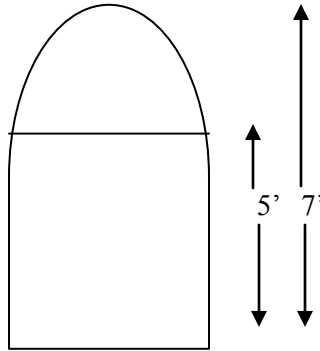
- (a) A
- (b) B
- (c) C
- (d) D
- (e) E

Problem 8. Which of the following is an inscribed angle in the diagram?



- (a) $\angle ABF$
- (b) $\angle DFG$
- (c) $\angle FEG$
- (d) $\angle DEG$
- (e) $\angle FHD$

Problem 9. Find the area of a window in the shape of a rectangle with a semicircle top.



- (a) 20 square feet
- (b) $20 + 2\pi$ square feet
- (c) $20 + 4\pi$ square feet
- (d) $10 + 2\pi$ square feet
- (e) $10 + 4\pi$ square feet

Problem 10. What is equal to the product $\sqrt{54x^4y^5} \cdot \sqrt{2x^2y^4}$ of radicals in the simplest radical form? (Assume that x and y are nonnegative.)

- (a) $6x^3y^4\sqrt{3y}$
- (b) $3x^3y^2\sqrt{12y^5}$
- (c) $6x^3\sqrt{3y^9}$
- (d) $2y^3\sqrt{27x^6}$
- (e) None of these

Problem 11. What is the mission statement of the National Society of Black Engineers? (Must be correct word for word)

Problem 12. What does the acronym LRP stand for?

Problem 13. What does the acronym CEB stand for?

Problem 14. What does the acronym NAB stand for?

Problem 15. Who is the 2008 – 2009 National Chair of NSBE?
