

**2012 John O'Bryan Mathematical Competition**  
**Freshman-Sophomore Individual Test**

and in simplest form. Exact answers are to be given unless otherwise specified in the question. No units of measurement are required. Each problem has the same point-value.

1. Set  $A = \{1, 2, 3, 4, 5\}$ . If one member of Set  $A$  is selected at random and substituted for  $x$  in the expression

11. Let  $p$  be a positive integer multiple of 8. Let  $A = \{p, 2p, 3p, 4p, p+2, p+3, p+4, p+24, \frac{1}{2}p, \frac{1}{3}p\}$ . What is the probability that a random draw from the set  $A$  will be divisible by 8 without remainder?
12. In rhombus  $ABCD$ , the degree measure of angle  $DAB$  is  $60^\circ$ . A circle passes through vertices  $A$ ,  $B$ , and  $D$  and intersects diagonal  $AC$  at  $E$ . If  $AE = 9$ , find the perimeter of the rhombus. Give your answer as a decimal rounded to two places.

Name: \_\_\_\_\_ **ANSWERS** \_\_\_\_\_

Team Code: \_\_\_\_\_

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**Note: All answers must be written legibly and in simplest form. Exact answers are to be given unless otherwise specified in the question. No units of measurement are required. Each problem has the**

same point-value (1 point).

1.            $\frac{2}{5}$           

11.            $\frac{1}{2}$  or 0.5          

2.           **NEVER**           Must be Full Word

12.           **31.18**