Math 206 - 1st Final Exam

Name _____

December 1, 2010

Score _____

Show all work. Supply explanations where necessary. Use only a compass and a straightedge for constructions. For each construction, the steps you follow must be apparent.

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1. (3 points) An experiment consists of simultaneously rolling a 4-sided die and flipping a quarter.

   (a) List the elements of an equally-likely sample space.

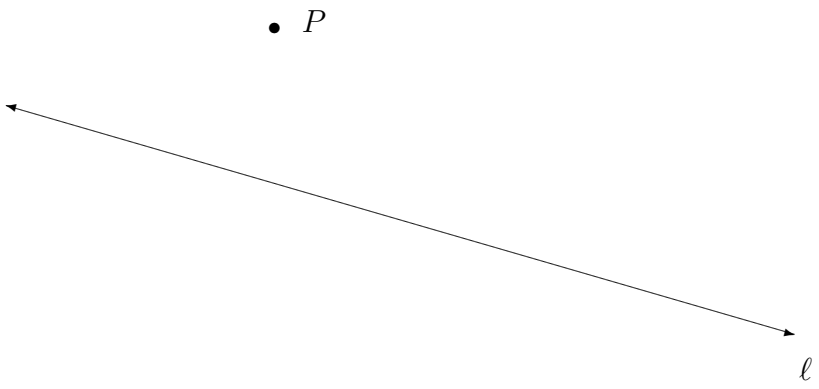
   (b) Referring to your sample space, what is the event of rolling a 2?

   (c) What is the probability of rolling a 1 or flipping a head?

   (d) Is your probability in part (c) an experimental probability or a theoretical probability?

2. (2 points) A ladybug lands in a random location on a meter stick. What is the probability that the bug lands between the 13 cm mark and the 17 cm mark?

3. (5 points) Use only a compass and straightedge to construct a line through P parallel to ℓ.



4. (5 points) A semicircle fits perfectly on top of a square. If the square has sides of length 23 in, find the distance around the outside of the figure. Write your final answer in meters, rounded to the nearest hundredth.

5. (6 points) The organizers of a charity event have planned the following game:

   Contestants will pay $5 to randomly select a bill from a box containing one $100 bill, two $20 bills, two $10 bills, five $5 bills, and ninety $1 bills.

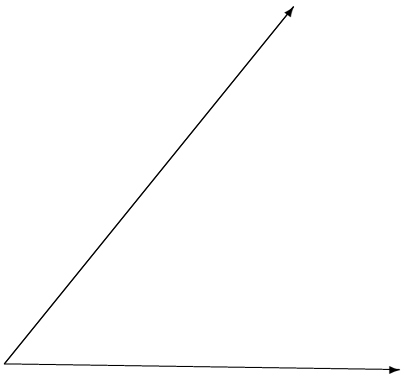
   (a) On average, how much should the event organizers expect to make for each person who plays the game?

   (b) Is the game fair? Explain.

   (c) What are the odds against selecting a $5 bill?

6. (3 points) What is the difference between a line plot and a line graph? Give an example of a situation in which you would use each type of graph.

7. (6 points) Copy the given angle so that its initial side lies on the given line. Then bisect the copied angle.



8. (6 points) Two letters are selected at random, one at a time without replacement, from the following box.

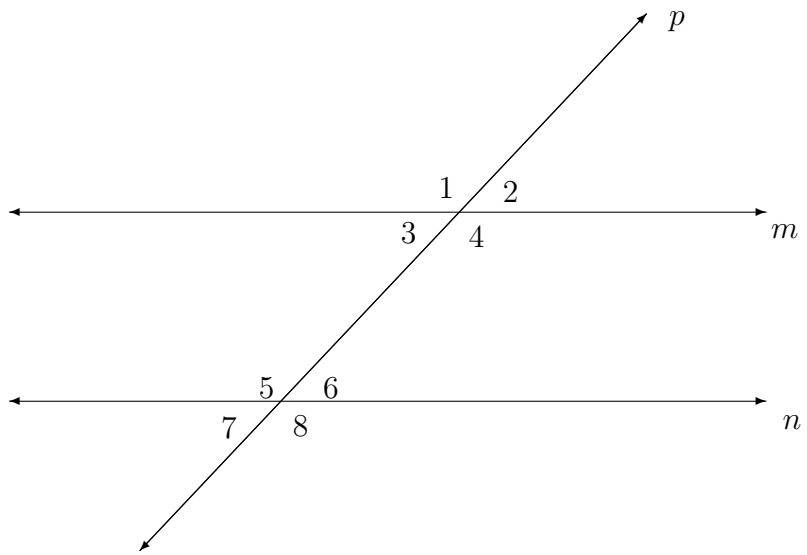
A A B C

(a) Sketch the probability tree diagram associated with this two-stage experiment.

(b) What is the probability that one of the selected letters is a C?

(c) What are the odds in favor of drawing a C?

9. (6 points) In the following figure, the parallel lines m and n are being cut by transversal p.



(a) Name a pair of alternating exterior angles.

(b) Name a pair of corresponding angles.

(c) Name a pair of alternating interior angles.

(d) Name a pair of vertical angles.

(e) Name a pair of adjacent angles.

(f) Name a pair of supplementary angles that are not adjacent.

10. (5 points) Last year the junior high spirit squad sold items as homecoming souvenirs. In all, they sold 61 pom-pons for \$1 each, 57 pins for \$1 each, 19 cups for \$2 each, 45 key rings for \$3 each, and 3 T-shirts for \$22 each.

    (a) Find the mean, median, and mode(s) of the amounts collected for homecoming souvenirs.

    (b) Which measure of central tendency is most appropriate when describing the average price paid for a souvenir? Why?

11. (3 points) Sketch a convex pentagon. What is the sum of the measures of the interior angles? Explain how your result can be derived by using triangles.

12. (5 points) Which of the following could be used as a definition of a square? Circle all that apply. Explain your reasoning to get partial credit.

    (a) A square is a rhombus with a right angle.

    (b) A square is a quadrilateral with four congruent sides.

    (c) A square is a rectangle that is also a kite.

    (d) A square is a kite with a right angle.

    (e) A square is a rectangle that is also a rhombus.

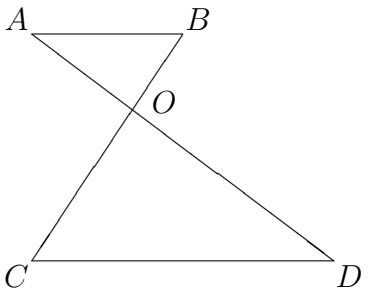
    (f) A square is a parallelogram that is also a kite.

13. (4 points) Stacy makes \$4000 each month, and \$800 of that goes to paying her mortgage.

    (a) If Stacy was to build a circle graph (pie chart) showing her monthly expenditures, what would be the measure of the angle of the portion of the circle graph corresponding to her mortgage?

    (b) Use your protractor to construct an angle with the measure from part (a).

14. (5 points) Given that $AB \parallel CD$, prove that $\triangle AOB$ is similar to $\triangle DOC$. Carefully explain your reasoning.



15. (5 points) Fill in the blank with the correct word or phrase.

(a) A simple, closed, polygonal curve is called a(n) _____.

(b) A(n) _____ angle is an angle whose measure lies between $0°$ and $90°$.

(c) CPCTC stands for _____.

(d) A polygon for which all sides are congruent and all interior angles are congruent is called a(n) _____ polygon.

(e) If the sum of the measures of two angles is $90°$, then the angles are said to be _____.

16. (2 points) Given the figure below and no other information, which of the following statements is not necessarily true?

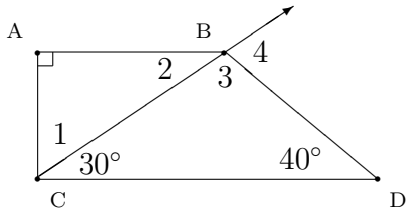
(a) $m(\angle 3) = 110°$

(b) $m(\angle 1) = 60°$

(c) $m(\angle 1) + m(\angle 2) = 90°$

(d) $70° + m(\angle 3) = 180°$

(e) $\angle 1$ is an acute angle.



17. (4 points) Consider the following collection of test scores.

98	52	98	45
37	45	98	79

(a) Compute the mean and standard deviation. You may use your calculator to compute the standard deviation.

(b) Compute the z-score corresponding to 88.