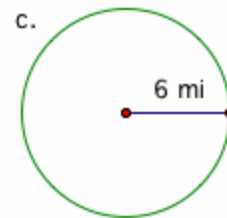
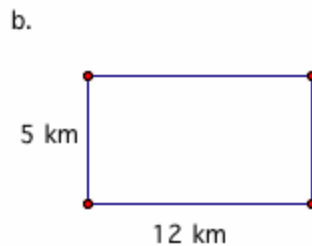
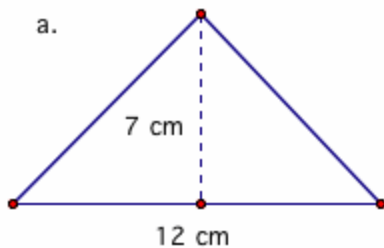


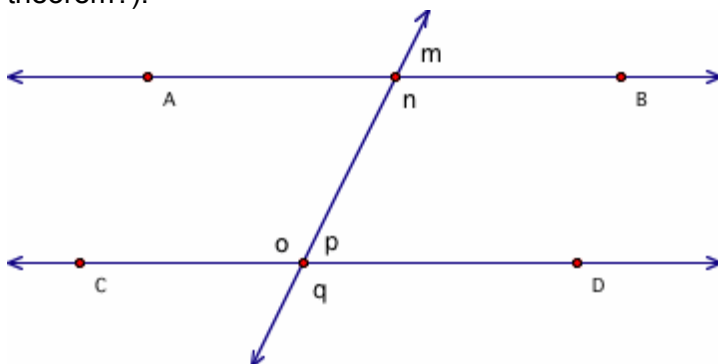
Exam 1 Review

Math 1175, Fundamentals of Mathematics
Mathematics and The Brooklyn Bridge

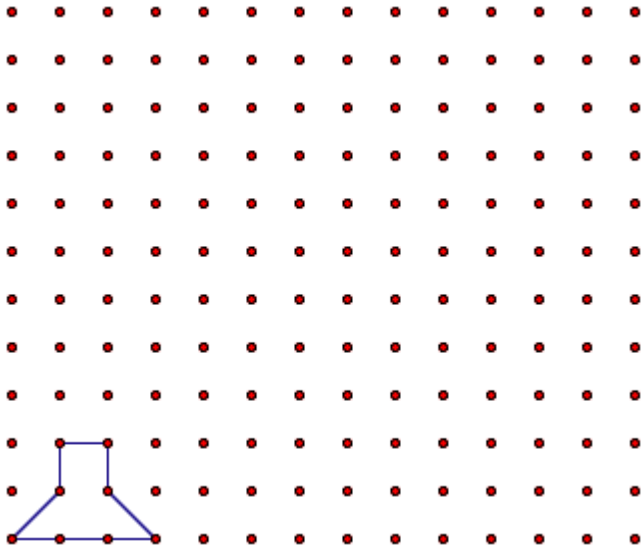
- What are the measures of the angles that share a vertex at the center of:
 - A clock, between consecutive hours?
 - A clock, between consecutive minutes?
 - A clock, between the hour hand and the minute hand, when the clock reads 2:30?
 - A cross?
 - A Mercedes symbol?
- Can you have a triangle with both a right angle and an obtuse angle? Why or why not?
- Suppose an angle measures 40 degrees.
 - Find the supplementary angle.
 - Find the complementary angle.
- Find the area of the triangle in figure a., the area and perimeter of the rectangle in figure b., and the area and circumference of the circle in figure c. below (use the approximation $\pi \approx 3.14$



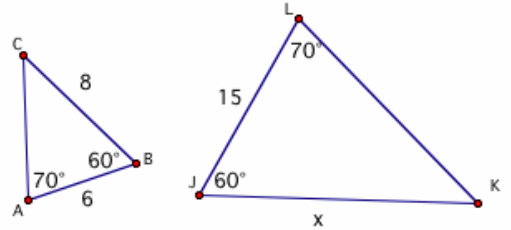
-).
- For each type of triangle listed below, give two possible sets of three angles (In some cases, there is only one possibility). If the triangle described is impossible, explain why.
 - Acute isosceles.
 - Right scalene.
 - Equilateral.
 - Right isosceles.
 - Right equilateral.
 - Obtuse scalene.
 - Which of the triangles listed in question 7 above have two angles that add up to 90 degrees?
 - In the diagram below, line AB is parallel to line CD. Suppose that $m = 55$ degrees. Find the measures of angles n , o , p and q . Explain how you found each angle (did you use a fact like the Z, F or C theorem?).



- Use the grid to draw a scaled copy of the figure at bottom right that is three times larger than the original.



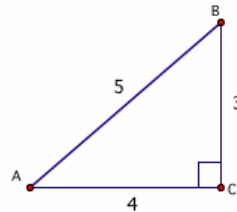
9. Use the diagram at right to answer the questions.
- Are the triangles similar? Explain why, and write a similarity statement.
 - Find x .



10. A cookie recipe calls for 2 cups of butter and 3 cups of sugar. If we plan to make a large batch of cookies with 5 cups of sugar, how many cups of butter should we use? (Write answer as mixed number in lowest terms, e.g., $2\frac{1}{2}$ cups.)
11. A scale model of a subway car measures 13 inches tall. The actual car is 12 feet tall. How car in feet?

inches long and 3 long is the actual

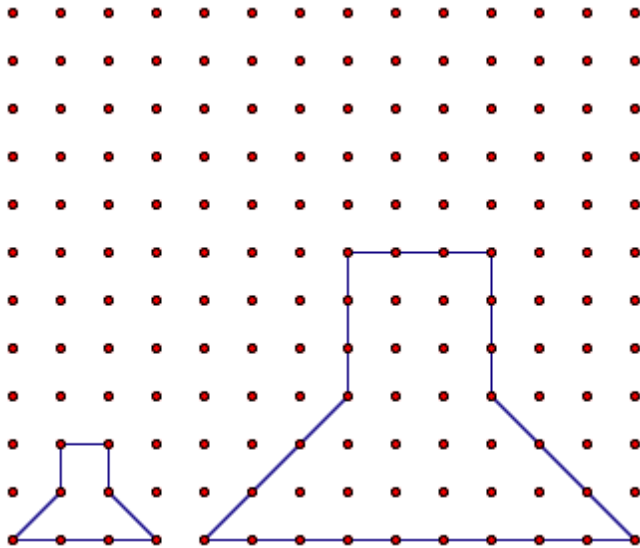
12. Use the diagram at right to find:
- $\sin A$
 - $\cos B$
 - $\tan B$
 - angle A (to the nearest tenth of a degree)



13. At a distance of 1000 feet from the center of the Empire State Building, the angle between the ground and the tip of the building's spire is 55.5 degrees. Use this information to calculate the height of the Empire State Building to the nearest foot.

ANSWER KEY

1. a. 30° b. 6° c. 105° d. 90° e. 120°
2. (short answer)
3. a. 140° b. 50°
4. a. $A = 42 \text{ cm}^2$ b. $A = 60 \text{ km}^2, P = 34 \text{ km}$ c. $A = 113.04 \text{ mi}^2, C = 37.68 \text{ mi}$
5. a. i. $70^\circ, 70^\circ, 40^\circ$ ii. $80^\circ, 80^\circ, 20^\circ$ (many other possible answers)
 b. i. $90^\circ, 30^\circ, 60^\circ$ ii. $90^\circ, 25^\circ, 65^\circ$ (many other possible answers)
 c. $60^\circ, 60^\circ, 60^\circ$ (this is the only correct answer)
 d. $90^\circ, 45^\circ, 45^\circ$ (this is the only correct answer)
 e. Impossible (explain why!)
 f. i. $100^\circ, 50^\circ, 30^\circ$ ii. $135^\circ, 15^\circ, 30^\circ$ (many other possible answers)
6. right scalene and right isosceles (b and d)
7. $p = 55^\circ$ (F theorem), $n = 125^\circ$ (C theorem), $q = 125^\circ$ (F theorem), $o = 125^\circ$ (o and p are supplementary). NOTE: you may have used other theorems/justifications in your answer.
- 8.



9. a. $A=L$ and $B=J$ (these angles have the same measures as marked in the diagram), and so $\triangle ABC \sim \triangle LJK$ (by the AA theorem).
 b. $x=20$
10. $3 \frac{1}{2}$ cups of butter
11. The subway car is 52 feet long.
12. a. $\sin A = 3/5$ b. $\cos B = 3/5$ c. $\tan B = 4/3$ d. $A = 36.9^\circ$
13. The Empire State Building is 1454 feet tall. Note that the new 1 World Trade Center will be 1776 feet and will be the tallest building in the country. Contrast these heights with the world's tallest man-made structure, 2,717 ft Burj Khalifa in Dubai, United Arab Emirates, well over a $\frac{1}{2}$ mile!