

## Homework 1

Answer the following questions. Your answers should be typed and turned in on Blackboard and follow the formatting requirements defined in the syllabus.

1. Identify five companies in McLennan County that hire engineers.
2. What do each of these companies specialize in?

*Due Tuesday, June 2, at the beginning of class.*

## Homework 2

### Day 3 Spelling List (In-Class Spelling Test is Homework 2)

Be prepared to spell each of the following words correctly on the spelling test on Day 3.

1. recommend
2. basically
3. proportional
4. occurrence
5. resonance
6. hydraulic
7. pneumatic
8. separate
9. maintenance
10. auxiliary
11. reservoir
12. discrepancy
13. procedure
14. necessary
15. comparative
16. receive

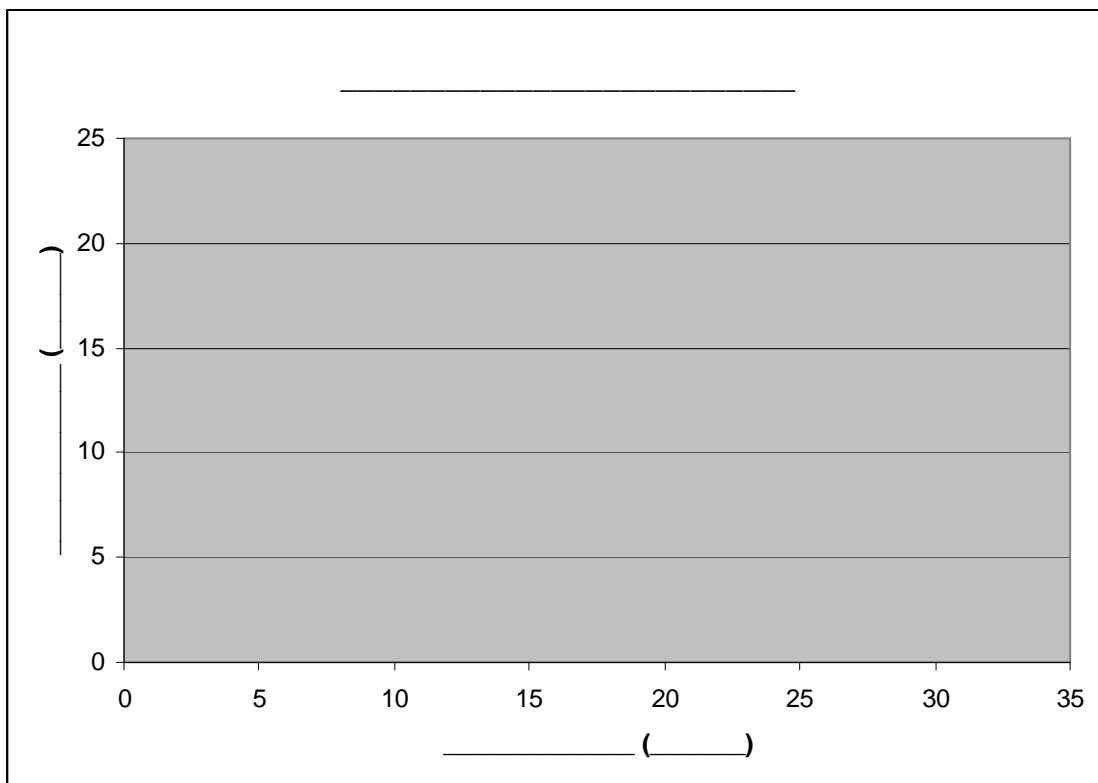
*The spelling test will occur Wednesday, June 3, at the beginning of class.*

### Homework 3

Work each problem below. For 20 bonus points, complete the assignment using a computer program such as Microsoft Excel or Open Office Calc. Alternatively, you may complete the assignment on this paper.

1. Graph the information in the following table which shows the speed of a running dog on an (x, y) plane. Label the axes with words and units and title the graph appropriately.

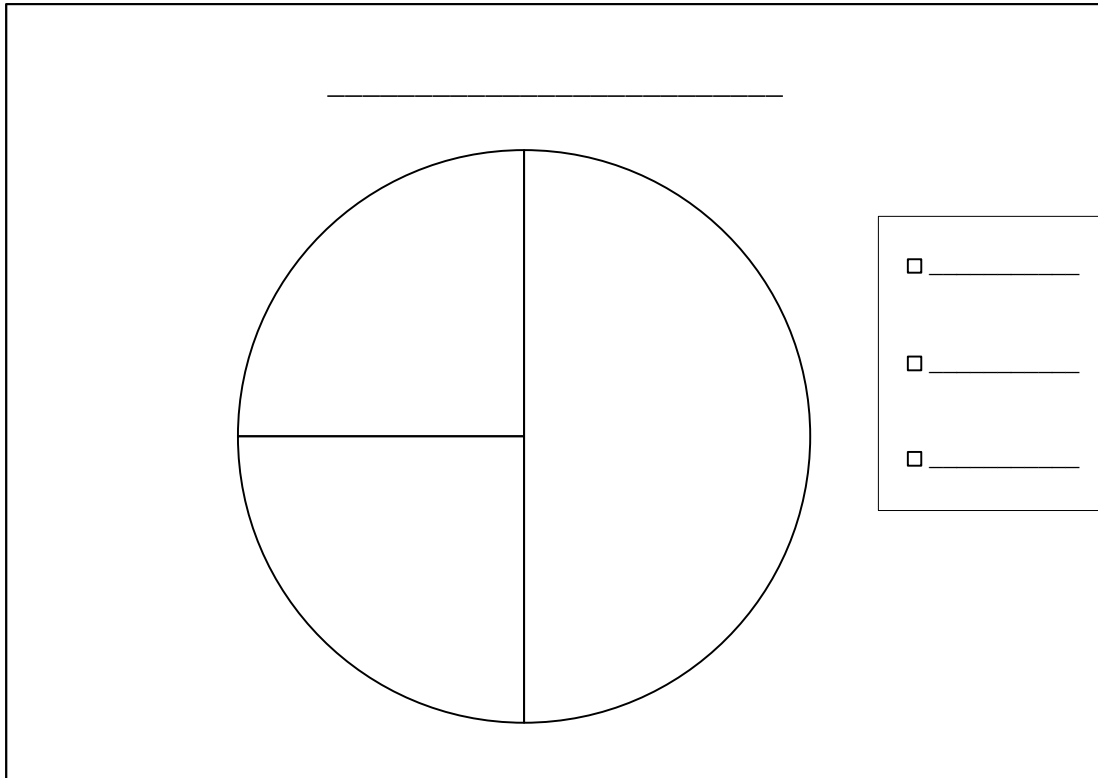
Time (s)	Speed (m/s)
5	14
10	18
15	12
20	17
25	22
30	19



2. Use a pie chart to display the following information regarding ice cream eating preferences:

- 50% prefer chocolate
- 25% prefer vanilla
- 25% prefer strawberry

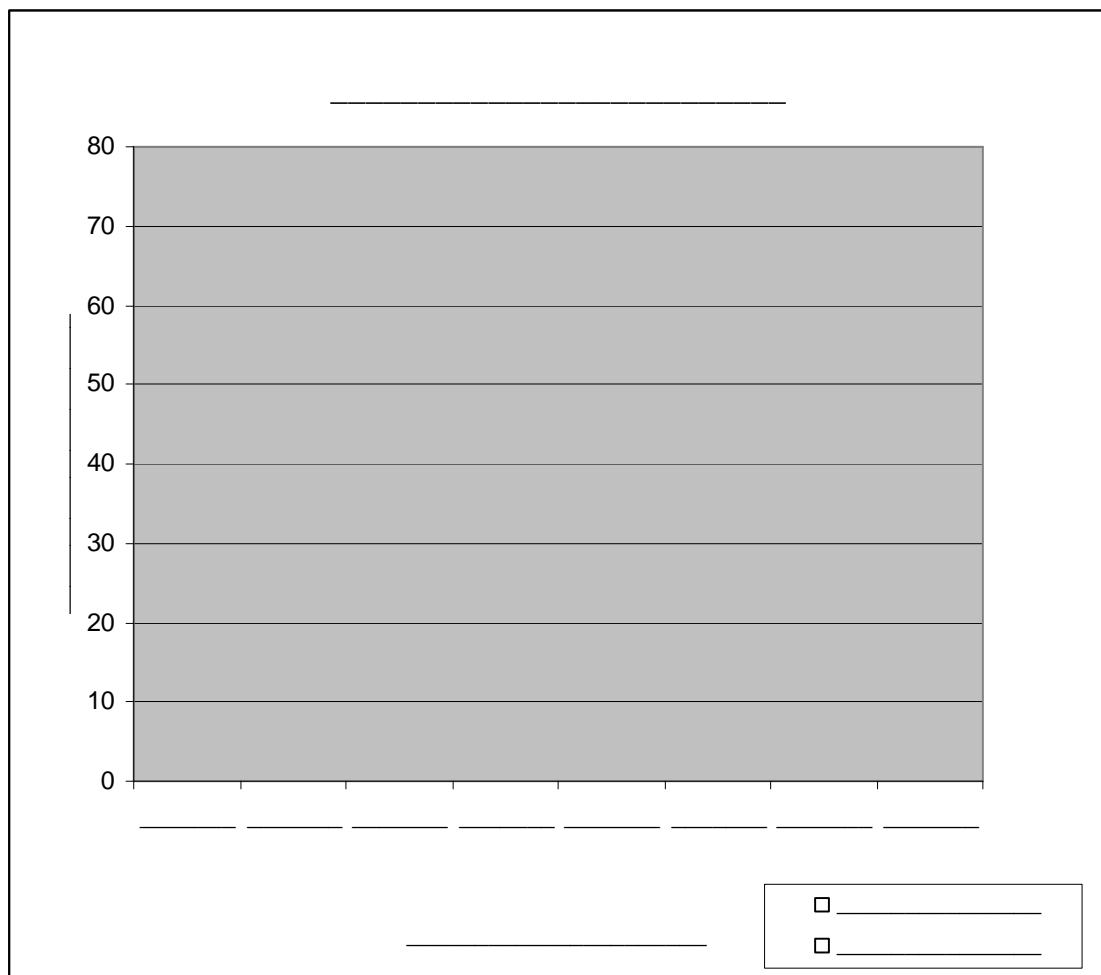
Label each portion of the graph with the type of ice cream and the percentage, and give the graph an appropriate title. Use a colored pencil or crayon to shade the appropriate regions.



3. Draw a bar chart to display the following information.

- In 2001, a local animal shelter found homes for 55 dogs and 75 cats.
- In 2002, they found homes for 43 dogs and 29 cats.
- In 2003, they found homes for 41 dogs and 39 cats.
- In 2004, they found homes for 64 dogs and 51 cats.
- In 2005, they found homes for 44 dogs and 41 cats.
- In 2006, they found homes for 50 dogs and 33 cats.
- In 2007, they found homes for 33 dogs and 29 cats.
- In 2008, they found homes for 48 dogs and 31 cats.

Pair each piece of information (dog and cat) for each year. Draw in the appropriate bars, as discussed in class, and use a colored pencil or crayon to shade the appropriate regions. Give the graph an appropriate title, and create a legend.



*Due Thursday, June 4, at the beginning of class.*

## Homework 4

Choose a chapter out of your engineering book, or choose a chapter out of a technical book or article out of a magazine. Write a 300-word abstract about the chapter or article. Your abstract should be typed and turned in on Blackboard and follow the formatting requirements defined in the syllabus.

*Due Monday, June 8, at the beginning of class.*

## Homework 5

Answer the following questions. Your answers should be typed and turned in on Blackboard and follow the formatting requirements defined in the syllabus.

1. Identify five schools that offer an engineering degree in which you are interested.
2. Print out five degree plans and determine which classes you have that might satisfy their requirements.

*Due Tuesday, June 9, at the beginning of class.*

## Homework 6

1. If you haven't already, get a binder, and organize all of your notes, handouts, and assignments from this class. Organize your notes in chronological order. If you use a spiral, put the spiral in the binder. Punch holes in pages, as necessary, and put all your assignments in the binder. For the first page in your binder, make a table where you list all the grades you've made in the class so far, and leave room for grades yet to come. Bonus points for using tab dividers.
2. Recopy your notes from class on Tuesday, June 9. You can write them out by hand, or type them, as your prefer.

*On Wednesday, June 10, I will check each student's binder at the beginning of class and give them back. You will turn in your recopied class notes (the notes without the stars) for evaluation. Be sure and put your name on your notes.*

## Homework 7

Answer the following questions. Your answers should be typed and turned in on Blackboard and follow the formatting requirements defined in the syllabus.

1. Identify five companies that hire engineers in the field in which you are interested.
2. List five questions that you would like to ask an engineer who work at that company. These should be the kinds of questions you would ask when your interviewer asks, "Do you have any questions for me?"

*Due Thursday, June 11, at the beginning of class.*

## Homework 8

Answer the following questions. Your answers should be typed and turned in on Blackboard and follow the formatting requirements defined in the syllabus.

1. Identify three engineering professional organizations. What type of engineering focus does the organization have? What are the annual fees? What kinds of conferences do each offer? Present your information in the form of a table with the following headings:
  - Organization Name
  - Focus
  - Annual Fees
  - Conferences
2. Identify four networking opportunities in McLennan County that will occur before August 1. Look at the Chamber of Commerce websites for the different communities in Waco. List each event, the date it will meet, the location, and the sponsoring organization. Present your information in the form of a table with the following headings:
  - Meeting or Event Name
  - Meeting Date
  - Location
  - Sponsoring Organization

*Due Monday, June 15, at the beginning of class.*

## Homework 9

The United States is sending a crew of 20 people to settle the first colony on Mars. With a partner, determine the type of people who you think should be sent. Make a list from 1 to 20, and specify each person that you will send by occupation, gender, age, or any other characteristics you deem appropriate. This assignment may be written on notebook paper.

*Due Monday, June 15, at the end of class.*

## Homework 10

Determine how tall the letters should be on a one-way sign. Use the six steps of analytical problem solving to determine your answer. Write one paragraph for each of the steps. For the accuracy verification step, measure the letters on an actual one-way sign (there are many in downtown Waco) and explain why there may be a difference between your solution and the actual answer.

Note that there is no real “right or wrong” answer on this assignment. Rather, the aim is to get you thinking about how to solve a problem. If you were the first person ever to make a one-way sign, how would you decide how tall to make the letters?

You have several days to complete this assignment.

*Due Thursday, June 18, at the beginning of class.*

## Homework 11

Divide into groups and build the tallest possible tower that can support a 12-oz can of soda. Your team will be given one roll of masking tape and one package of plastic straws. Your tower must be free-standing and the base must be no greater than 12 inches in diameter. You can bend or cut the straws. The tower must stand with the can on top long enough for its height to be measured.

*Due Wednesday, June 17, at the end of class.*

## Homework 12

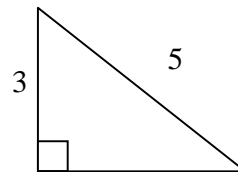
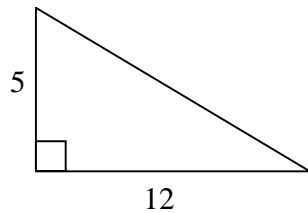
Disassemble one of the following devices. Using the methods discussed in class, sketch a diagram of all the parts and how they fit together. Choose from (a) flashlight, (b) lawn sprinkler, (c) sink faucet, (d) stapler, (e) toaster. This particular assignment may be hand-drawn on white paper in pencil, and need not be done in ink or typed.

*Due Monday, June 22, at the beginning of class.*

## Homework 13

Work each problem below. You may complete the assignment on this paper.

1. Determine the missing edges of the following right triangles.



2. Use your calculator to solve the following trig problems. Note that parts d – f are in degrees, while g – i are in radians. Hint: your answers to d and g should be the same, as should the answers to e and h, and the answers to f and i.

a.  $\tan \theta = 1$     $\theta =$  \_\_\_\_\_

b.  $\sin \theta = -1$     $\theta =$  \_\_\_\_\_

c.  $\cos \theta = 0$     $\theta =$  \_\_\_\_\_

d.  $\cos 30^\circ =$  \_\_\_\_\_

e.  $\sin 30^\circ =$  \_\_\_\_\_

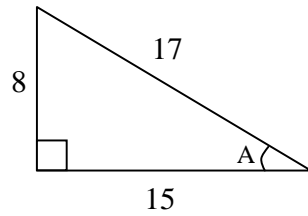
f.  $\tan 45^\circ =$  \_\_\_\_\_

g.  $\cos \frac{\pi}{6} =$  \_\_\_\_\_

h.  $\sin \frac{\pi}{6} =$  \_\_\_\_\_

i.  $\tan \frac{\pi}{4} =$  \_\_\_\_\_

3. Use what we learned in class to write the sine, cosine, and tangent of angle A in the right triangle below. Then use your calculator to find the value of angle A in degrees and in radians.



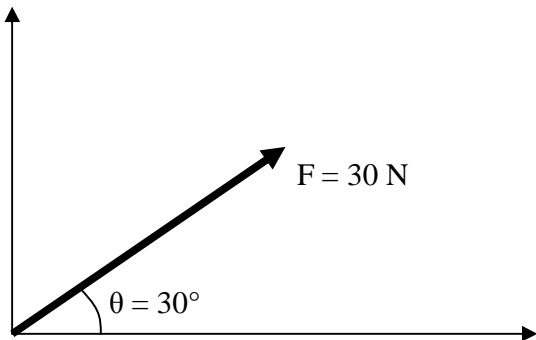
- a.  $\sin A =$  \_\_\_\_\_
- b.  $\cos A =$  \_\_\_\_\_
- c.  $\tan A =$  \_\_\_\_\_
- d.  $A =$  \_\_\_\_\_ degrees
- e.  $A =$  \_\_\_\_\_ radians

*Due Tuesday, June 23, at the beginning of class.*

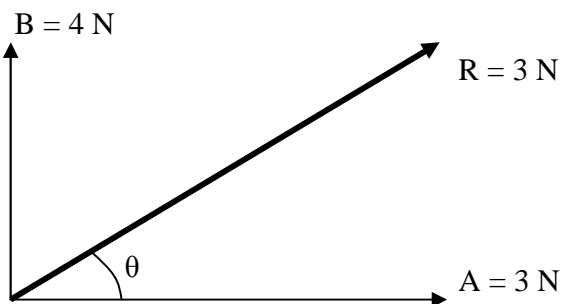
## Homework 14

Work each problem below. You may complete the assignment on this paper.

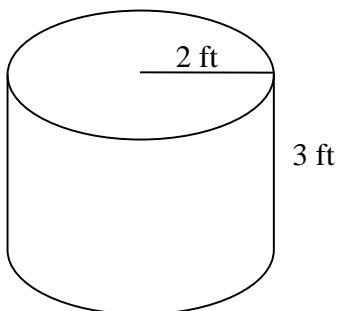
1. Given a vector **F** with a magnitude of 30 N and an angle off the  $x$ -axis of  $30^\circ$ , determine the  $x$  and  $y$  components of the vector.



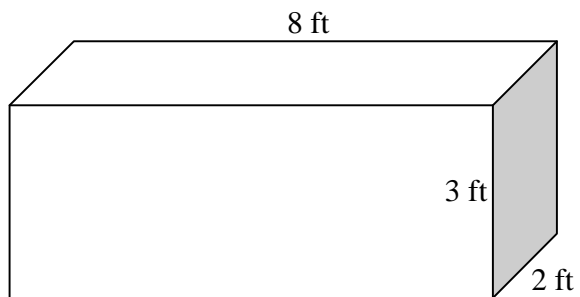
2. Given a vector **A** with magnitude 3 N along the  $x$ -axis and a vector **B** with magnitude 4 N along the  $y$ -axis, determine resultant **R** by determining the magnitude of **R** and the angle  $\theta$  in degrees.



3. Given the following cylinder, find its surface area and volume.



4. Given the following box, find its surface area and volume.



*Due Wednesday, June 24, at the beginning of class.*

## Homework 15

Work each problem below. You may complete the assignment on this paper.

1. List the number of significant digits in each measurement

- a. 150
- b. 23.5
- c. 18.900000
- d. 70,000.1
- e. 150.0

2. Convert the following values into the indicated units:

- a. 16 ft = \_\_\_\_\_ m
- b. 72° F = \_\_\_\_\_ ° C
- c. 200 km = \_\_\_\_\_ miles
- d. 5 km = \_\_\_\_\_ m
- e. 16° C = \_\_\_\_\_ ° F
- f. 12 m/s = \_\_\_\_\_ miles per hour

3. Assume you took the following measurements in the lab:

- 12.5 cm
- 12.6 cm
- 12.5 cm
- 12.7 cm
- 12.9 cm

Compute the average, and the error on the average.

Write your answer as \_\_\_\_\_ cm  $\pm$  \_\_\_\_\_ cm

*Due Thursday, June 25, at the beginning of class.*

## Homework 16

Type your lab report regarding the work you've done today in the lab. Give your measurements with units and errors, compute averages, and give the MSE.

*Due Monday, June 29, at the beginning of class.*