MATH 161 — Precalculus[1]
Community College of Philadelphia

©2000
Community College of Philadelphia
Joanne Darken
Martin Ligare

[1]Materials produced with the support of the National Science Foundation through a grant to the Middle Atlantic Consortium for Mathematics and its Applications throughout the Curriculum (MACMATC).

Math 161 — Chapter 1 Homework

1. If you buy 8 shares of stock at $\$6\frac{1}{8}$ per share, how much do you pay (neglecting any broker's fees)?

2. If you buy 6 shares of stock A at $\$3\frac{1}{4}$ per share, and 12 shares of stock B at $\$13\frac{5}{8}$ per share, how much do you pay (neglecting any broker's fees)?

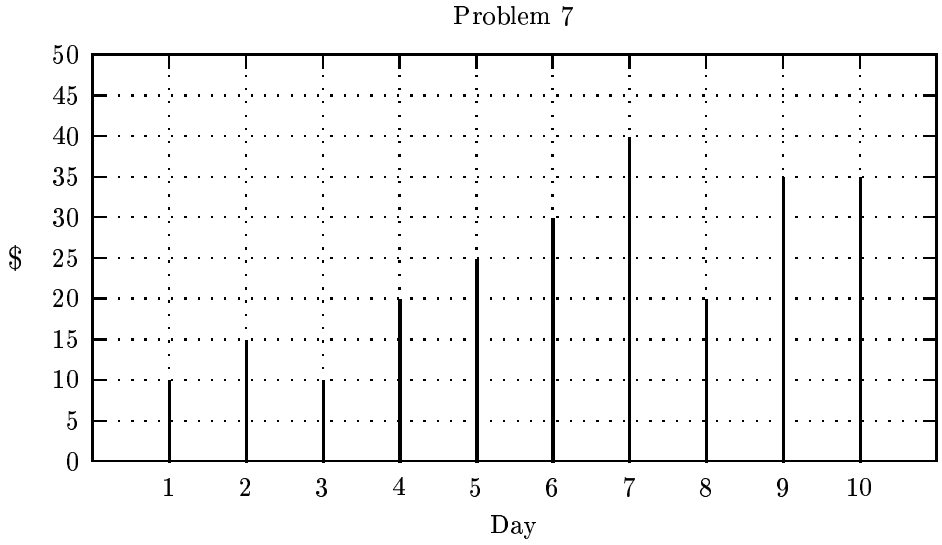
3. If you buy 16 shares of stock at $\$4\frac{1}{4}$ and sell at $\$6\frac{3}{8}$ how much do you gain or lose?

4. If you buy 88 shares of stock at \$10 and sell at $\$9\frac{1}{4}$ how much do you gain or lose?

5. If you buy 10 shares of stock at \$10 and sell at \$16 ten days later, what is the average gain (or loss) per day?

6. If you buy 60 shares of stock at \$100 and sell at \$40 thirty days later, what is the average gain (or loss) per day?

7. The following graph follows a hypothetical stock for a period of two trading weeks, or 10 days.



(a) What was the greatest value of the stock at closing during the illustrated trading period?

(b) On what day did the stock have the greatest value at closing?

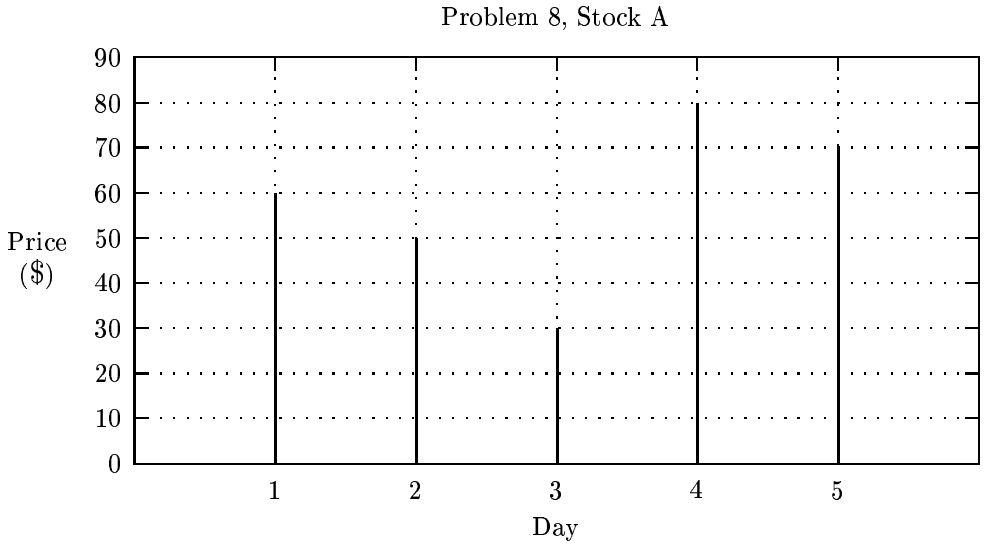
(c) What was the lowest value of the stock at closing during the illustrated trading period?

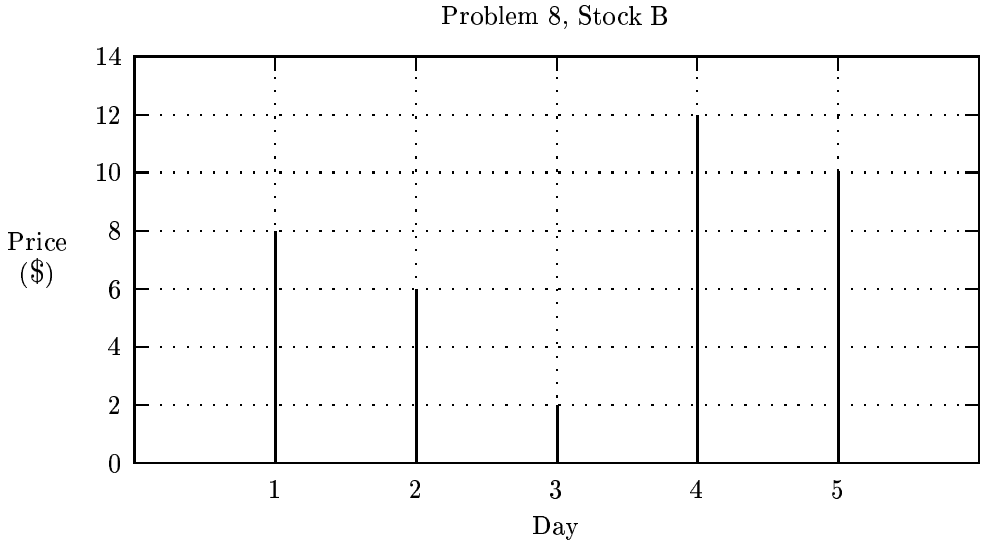
(d) On what day did the stock have its value at closing?

(e) If you purchased 50 shares of stock at the close of trading on day 1, and sold them at the close of trading on day 10, how much profit would you have made?

(f) If you had purchased 50 shares of stock at the close of trading on some day, and held it for **exactly** 2 days, which purchase day would have resulted in the greatest profit? **State exactly how much profit you would have made.**

8. The following 2 graphs represent hypothetical stocks, named A and B, for a period of one trading week, or 5 days. (Pay attention to the scales.)





(a) Imagine that you buy 10 shares of both stocks at the close of trading on day 1, and sell them at the end of trading on day 5.

i. How much did 10 shares of Stock A cost at the close of trading on day 1?

ii. How much did 10 shares of Stock B cost at the close of trading on day 1?

iii. How much did you sell your 10 shares of Stock A for at the close of trading on day 5?

iv. How much did you sell your 10 shares of Stock B for at the close of trading on day 5?

v. Which stock would give you the greatest profit in this scheme?

(b) Imagine that instead of buying equal numbers of shares of Stocks A and B, you instead invested an equal amount of money in Stocks A and B. Imagine that you started the week with \$600 to invest in Stock A, and \$600 to invest in Stock B.

i. How many shares of Stock A can you buy at the close of trading on day 1?

ii. How many shares of Stock B can you buy at the close of trading on day 1?

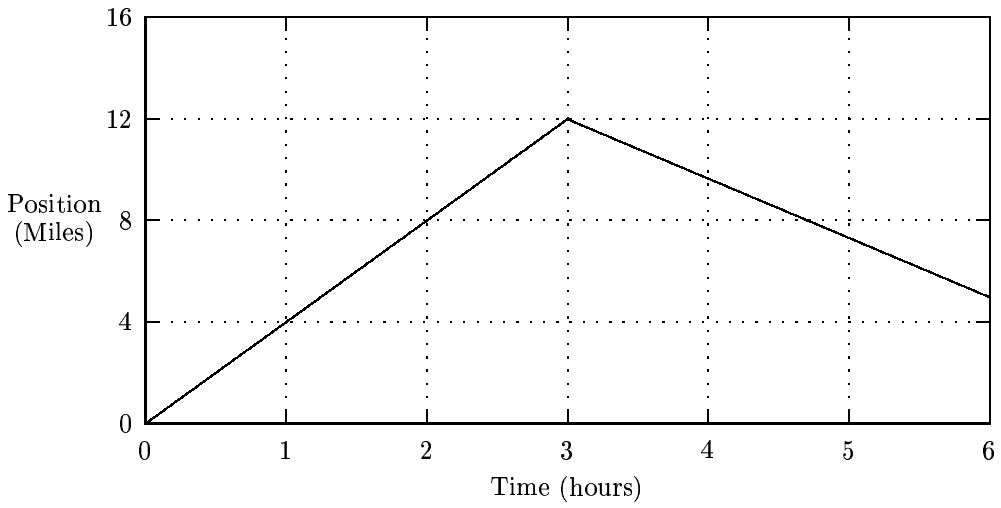
iii. How much money do you get when you sell your shares of Stock A at the close of trading on day 5?

iv. How much money do you get when you sell your shares of Stock B at the close of trading on day 5?

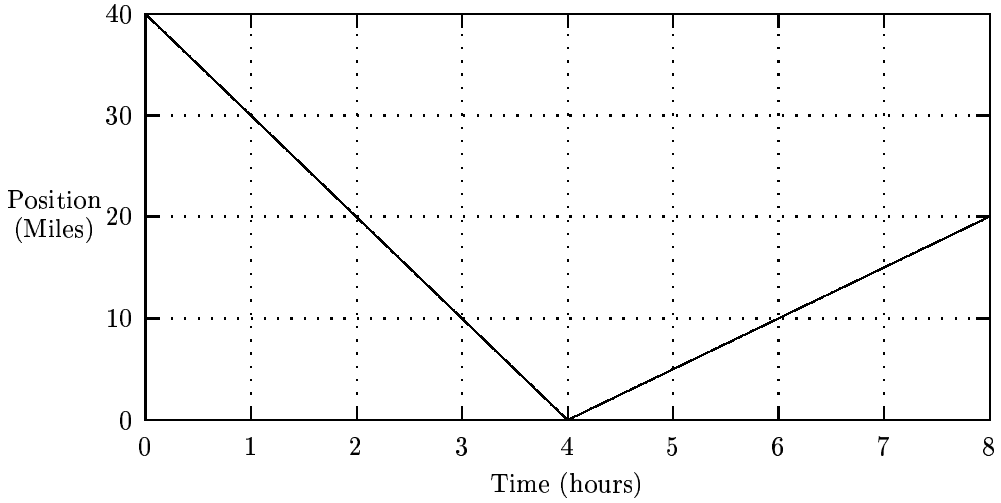
v. Which stock would give you the greatest profit if you invested this way?

9. Assume each of the following graphs is the *position versus time* graph for a walker. Give a specific and complete description of the person's motion. Your description should include enough information about the walker's position, speed, direction of travel during various time intervals that someone else can reconstruct the graph from your description.

Problem 9a



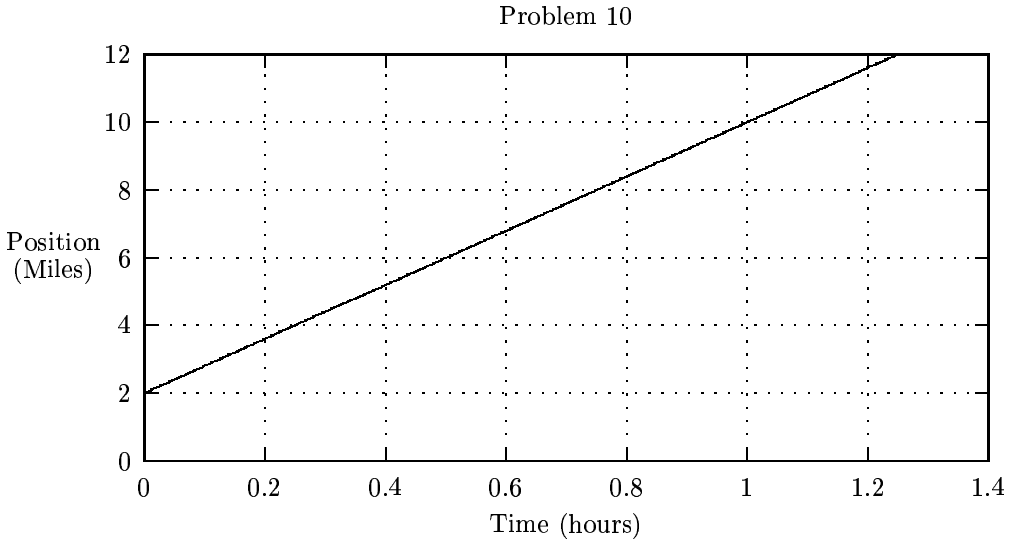
Problem 9b



10. The following graph shows the position of a runner A as a function of time during a 10 mile road race along a straight road. The race begins at mile marker 2 at time $t = 0$.

    (a) Calculate the speed of the runner in miles per hour. (In other words, calculate the slope of the line.)

    (b) Sketch the graph that shows the position of a runner B who runs at a steady pace, but faster than runner A and wins the race.



11. Sketch the graphs of the following equations:

    (a) $y = 3x - 7$

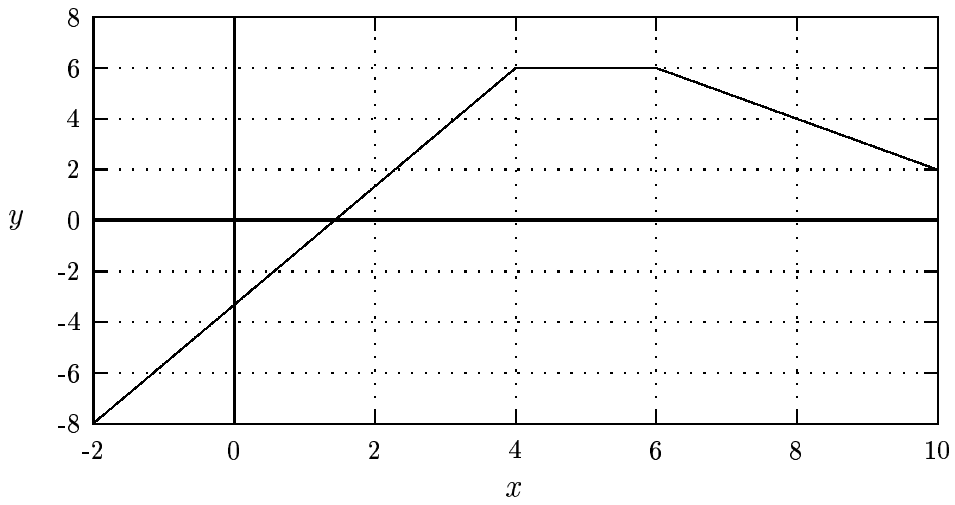
    (b) $y = 6 - x$

    (c) $2y = 6 - x$

    (d) $3x + 6y = 9$

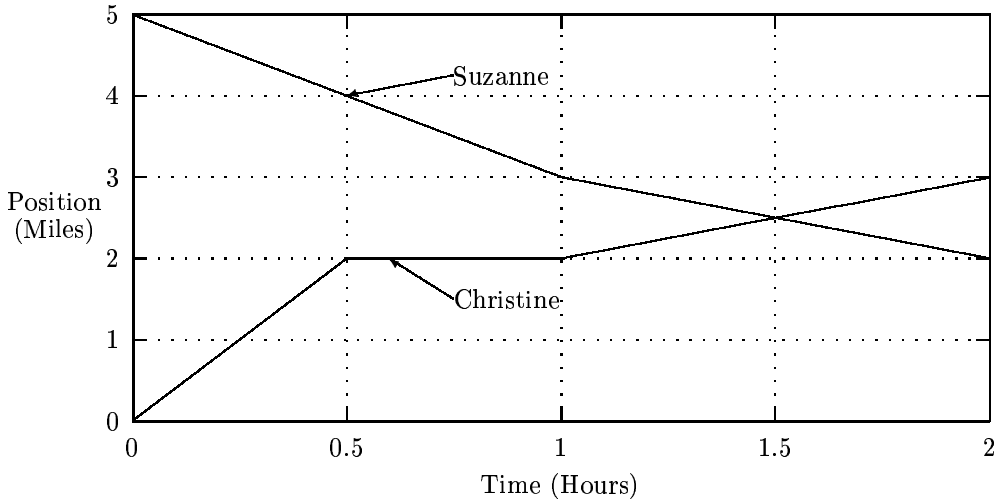
12. Find the slope of each straight segment of the illustrated graph.

Problem 12



13. The mile markers along a straight stretch of road start start at mile 0 in the west (let's say this is the left side of this piece of paper) and increase as you go from west to east (or left to right). Suzanne and Christine's positions as functions of time are illustrated on the following graph.

Problem 13



(a) From time $t = 0$ to $t = .5$ what is Suzanne's speed?

(b) From time $t = 0$ to $t = .5$ is Suzanne moving from left to right, or right to left?

(c) From time $t = 0$ to $t = .5$ what is Christine's speed?

(d) From time $t = 0$ to $t = .5$ is Christine moving from left to right, or right to left?

(e) i. Who takes a rest and stops during the illustrated time, Suzanne or Christine?

ii. When does she start her rest?

iii. How long does she rest for?

iv. Where is she when she rests?

(f) When do Suzanne and Christine pass each other?

(g) Where are Suzanne and Christine when they pass each other?

14. Find the equation of the following lines:

(a) The line through $(5, 3)$ and $(-5, -3)$.

(b) The line through $(6, 2)$ and $(20, 2)$.

(c) The line with y-intercept -3 and x-intercept 5.

(d) The line with y-intercept 4 and x-intercept 0.

(e) The horizontal line through the point $(-1, -2.5)$.

(f) The vertical line through the origin.

15. Match each of the following *position versus time* graphs with the verbal description that fits it. The narratives assume that the people start at a position that corresponds to the lowest illustrated vertical position in the graphs, and the "picnic" is at a position corresponding to a point near the top of the vertical scale in the graphs.

(a) Juan hurries to the picnic as fast as he can, then has to wait for the others.

(b) Mary starts out at a steady slow pace, and later speeds up.

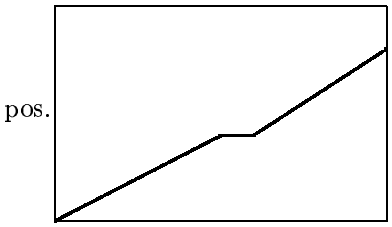
(c) Li walks steadily, stops to chat with a friend, and then continues at his original pace.

(d) Kelly starts out at a steady pace, then turns around and goes back to make sure the door is locked, and then hurries to the picnic.

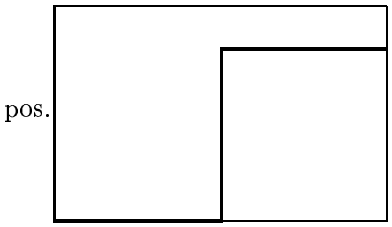
(e) George stays near his house until he is magically transported to the picnic in an instant by space aliens.

(f) Henry starts out to the picnic, slows down because he's thinking about a soccer game, and then returns home to watch the game on TV instead going to the picnic.

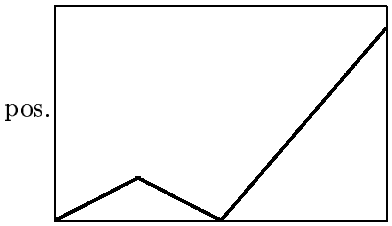
Graph #1



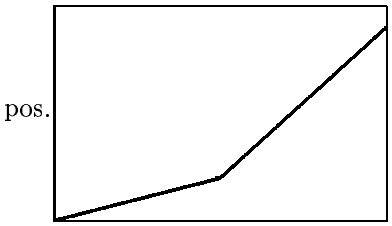
Graph #2



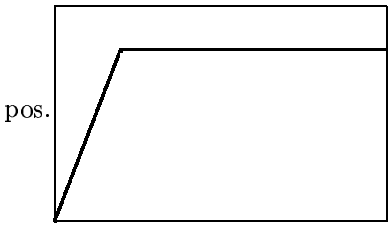
Graph #3



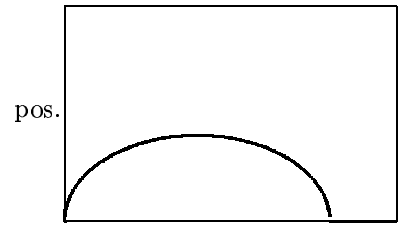
Graph #4



Graph #5

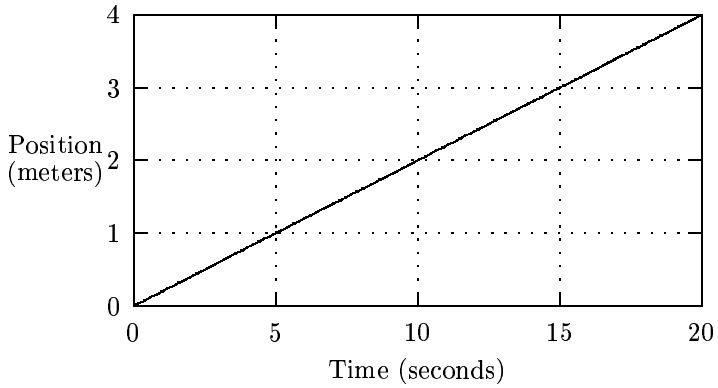


Graph #6

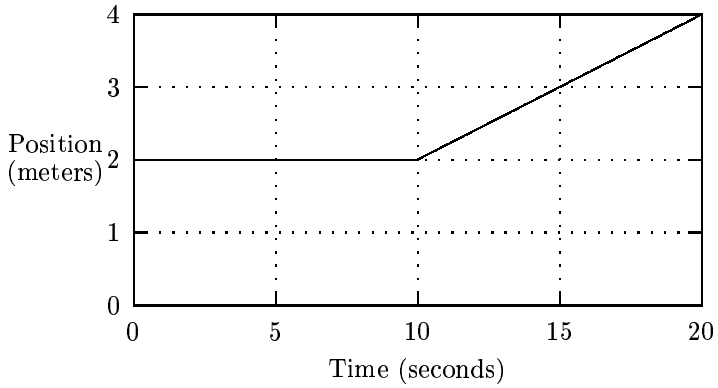


16. Each of the followings graphs is the *position vs. time* output from the type of motion sensor you used in class. For each of the graphs describe the motion you would execute to produce the graph. Be as specific as possible about speeds, times, and directions.

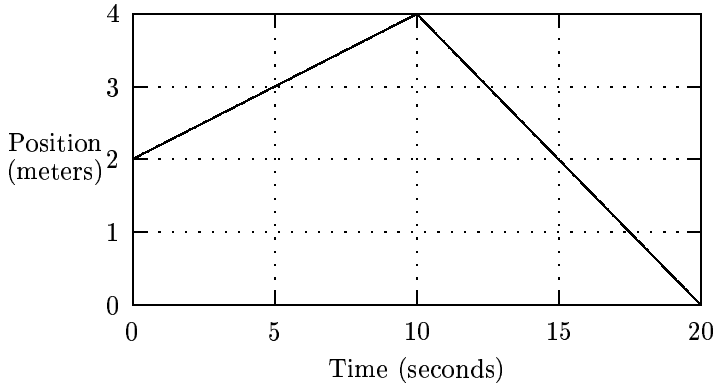
Problem 16a



Problem 16b



Problem 16c



17. Find the slope, y-intercept, and x-intercept of each of the following lines:

    (a) $y = 8x - 3$

    (b) $y = 6 - 2x$

    (c) $y = (3x - 5)/3$

    (d) $2x - 3y = 7$

    (e) $5x + 8y = 0$

    (f) $4y + 3(x - 2) = 7(y + 2(x - 1))$

    (g) the line through the points $(9, 2)$ and $(-7, -4)$

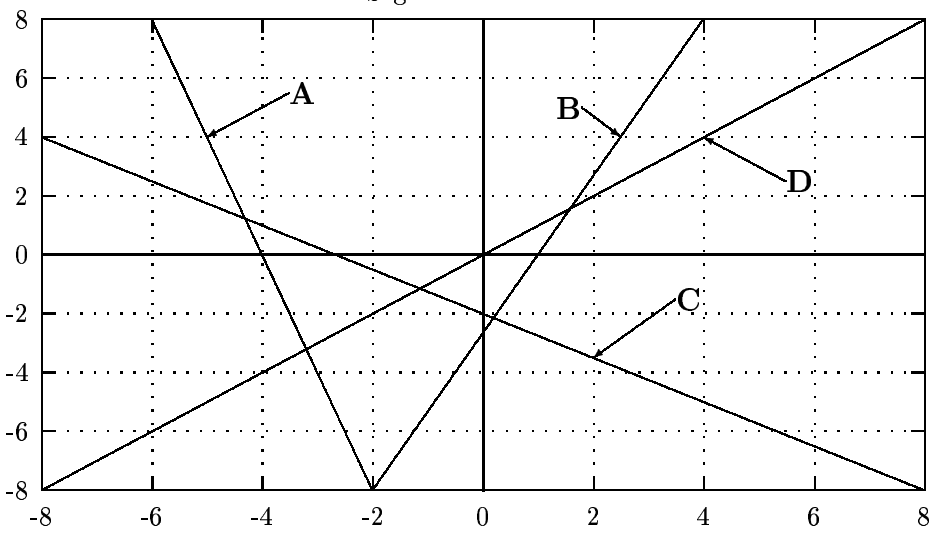
    (h) the line through the points $(-6, 2)$ and $(5, 9)$

    (i) a line perpendicular to the line $y = 8 - 3x$.

    (j) a line parallel to the line $2x - 7y + 9 = 0$.

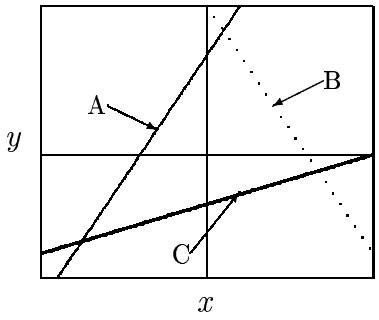
18. Find the slope of each line segment shown on the following graph, and list them in order of least to largest. (Remember, least means farthest to the left on the number line.)

Line Segments for Problem 18



19. Examine the the lines on each coordinate system shown below and order the line segments by slope, from least to greatest.

Problem 19a



Problem 19b