

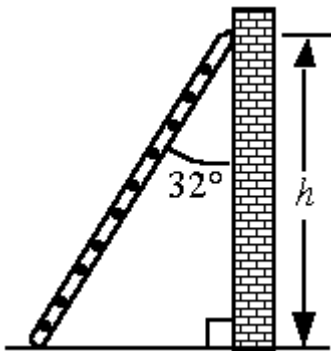
**Phys 132 - Fundamentals of Physics 2**  
**Homework 2**

**Name:** \_\_\_\_\_  
**Due Mon, Jan 22, 2007**

**Reading Assignment:** Read Chapter 18, Sections 18.1 thru 18.7. One of the problems comes from the new material on the electric field.

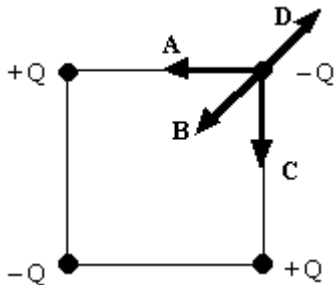
Print out this homework assignment. Complete each of the following problems and circle the letter of the correct answer. For those problems that involve math, show all your work NEATLY.

1. A 2.5-m ladder leans against a wall and makes an angle with the wall of  $32^\circ$  as shown in the figure. What is the height  $h$  above the floor where the ladder makes contact with the wall?



- A) 2.1 m  
B) 1.3 m  
C) 2.4 m  
D) 1.6 m  
E) 1.9 m
2. A force vector has a magnitude of 810 N and points at an angle of  $18^\circ$  above the  $x$ -axis. What are the  $x$  and  $y$  components of this force?
- |    | <i>x component</i> | <i>y component</i> |
|----|--------------------|--------------------|
| A) | 770 N              | 250 N              |
| B) | 560 N              | 585 N              |
| C) | 585 N              | 560 N              |
| D) | 250 N              | 750 N              |
| E) | 713 N              | 385 N              |

3. The  $x$  and  $y$  components of a force vector are  $-3.00$  N and  $+4.00$  N, respectively. What angle does this vector make with the positive  $x$  axis?
- A)  $233^\circ$   
 B)  $127^\circ$   
 C)  $-53.0^\circ$   
 D)  $53.0^\circ$   
 E)  $37.0^\circ$
4. A vector  $\mathbf{F}_1$  has a magnitude of  $40.0$  units and points  $35.0^\circ$  above the positive  $x$  axis. A second vector  $\mathbf{F}_2$  has a magnitude of  $65.0$  units and points in the negative  $y$  direction. Use the component method of vector addition to find the magnitude and direction, relative to the positive  $x$  axis, of the resultant  $\mathbf{F} = \mathbf{F}_1 + \mathbf{F}_2$ .
- A)  $53.3$  units,  $52.1^\circ$  below the  $+x$  axis  
 B)  $53.3$  units,  $52.1^\circ$  above the  $+x$  axis  
 C)  $76.3$  units,  $37.9^\circ$  below the  $+x$  axis  
 D)  $76.3$  units,  $52.1^\circ$  above the  $+x$  axis  
 E)  $9.23$  units,  $37.9^\circ$  below the  $+x$  axis
5. Four point charges, each of the same magnitude, with varying signs are arranged at the corners of a square as shown. Which of the arrows labeled **A**, **B**, **C**, and **D** gives the correct direction of the net force that acts on the charge at the upper right corner? (Hint: Redraw the figure without the lettered arrows, draw in the correct forces, and add the forces graphically. Remember that nearby charges exert more force than far charges.)

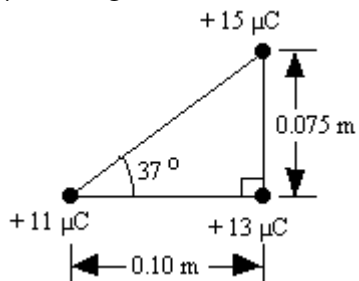


- A) **A**  
 B) **B**  
 C) **C**  
 D) **D**  
 E) The net force on that charge is zero.

6. A charge  $Q$  exerts a 12 N force on another charge  $q$ . If the distance between the charges is doubled, what is the magnitude of the force exerted on  $Q$  by  $q$ ?

- A) 3 N
- B) 6 N
- C) 24 N
- D) 36 N
- E) 48 N

7. Three charges are positioned as indicated in the figure. What are the horizontal and vertical components of the net force exerted on the  $+15 \mu\text{C}$  charge by the  $+11 \mu\text{C}$  and  $+13 \mu\text{C}$  charges?



- |    | <u>horizontal</u> | <u>vertical</u> |
|----|-------------------|-----------------|
| A) | 95 N              | 310 N           |
| B) | 76 N              | 310 N           |
| C) | 250 N             | 130 N           |
| D) | 95 N              | 130 N           |
| E) | 76 N              | 370 N           |