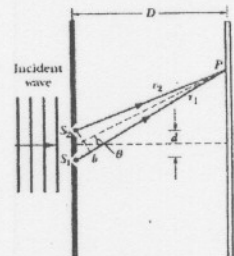


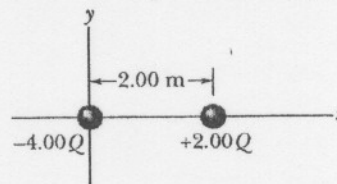
普通物理學 試題 (限用答案本作答)

可以使用計算機

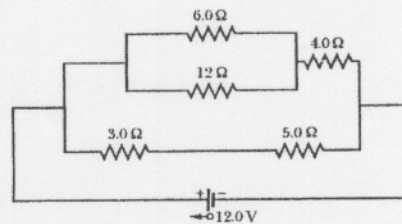
1. In a double-slit experiment, $\lambda=546$ nm, $d=0.1$ mm, and $D=20$ cm. On a viewing screen, what is the distance between the fifth maximum and the seventh minimum from the central maximum? (15%)



2. Two charged particles are fixed in place in the figure.
 (a). What is the x coordinate of the point (on the x -axis) at which the net electric field is zero? (b). What is the x coordinate of the point (on the x -axis) at which the net electric potential is zero? (15%)

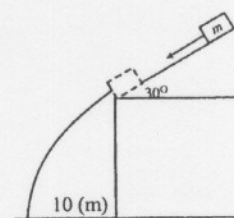


3. A circuit containing five resistors connected to a battery with a 12.0 V is shown in the figure. What is the potential difference across the 5.0 Ω resistor? (15%)



4. At 20°C, a copper cube has an edge length of 30 cm. What is the increase in the cube's surface area when it is heated from 20°C to 75°C? (coefficient of linear expansion for copper is $17 \times 10^{-6}/^\circ\text{C}$) (15%)

5. A block of mass m starts from rest and slides without friction down an incline that is at an angle of 30° with the horizontal as shown in the figure. ($g=10.0$ m/s²) (15%)



- (a). What is the acceleration of the block while it is in contact with the incline?
 (b). If the block leaves the incline with a speed of 20 m/s, what is the length of the incline?
 (c). If the block lands on the floor at the point shown, how long does it take the block to fall from the edge of the incline to the floor?
6. In question 5, if the incline is NOT frictionless (assume the coefficient of friction is $\frac{1}{2\sqrt{3}}$). What are the answers for (a). and (b). in the question 5. (15%)

7. A boy is seated on the top of a hemispherical mound of ice. He is given a very small push and starts sliding down the ice. Show that he leaves the ice at a point whose height is $2R/3$ if the ice is frictionless. (Hint: The normal force vanishes as he leaves the ice.) (10%)

