PROBLEM SOLVING COMPLETE SOLUTION

QUESTION

1. A 0.05 kg tennis ball approaches a racket at 25 m/s. If it is not in contact with the racket's strings for 0.005 s, then rebounds at 25 m/s, what is the average contact force between the ball and the racket? Ignore air resistance.
2. A 5.0 kg crate initially at rest on a smooth surface is acted upon by two opposing forces: 50 N to the right and 30 N to the left. Find the acceleration of the block and the distance it moves in 10 s.

ANSWER

1. **F = 500 N**
2. **a = 4 m/s²**
d = 400 m

Explanation

Problem Solving
1. $F = m\Delta v / t$
$= 0.05(25-(-25)) / 0.005$
$= 2.5/0.005$
F = 500 N
2. $F_1 = 50$ N
$F_2 = 30$ N
$F_{net} = F_1 - F_2$
$F_{net} = 50-30$
$F_{net} = 20$ N

$a = F_{net}/m$
$= 20 / 5$
a = 4 m/s²

$v = at$
$= 4(10)$
$= 40$ m/s

$d = vt$
$= 40(10)$
d = 400 m