

## Solutions to supplemental problems.

1. a) 205 m  
b) -45 m  
c) 205 m
2. average speed = 15 km/h  
average velocity = 0
3. a) 25 km/h  
b) 145 km/h
4. a)  $84.0^\circ$   
b)  $27.0^\circ$   
c)  $35.0^\circ$   
d)  $7.99^\circ$   
e)  $49.0^\circ$   
f)  $12.0^\circ$
5. a) .53  
b) 1.0  
c) 1  
d) 1.6  
e) .64  
f) .33
6. 42 m @  $45^\circ$  S of E
- 7.
8. 112 m/s @  $27^\circ$  S of E
9. 48.1 m  $3.6^\circ$  N of E
10. N = 193 km  
E = 230 km
11. X = -86.6 km/h  
Y = -50 km/h
12. 580 km/h @  $54^\circ$  E of N
13. a) 140 N  
b) 20 N  
c) 100 N
14. a) 90 N  
b) 87 N  
c) 83 N  
d) 79 N  
e) 67 N  
f) 30 N
15. 820 N @  $232^\circ$  ( $52^\circ$  W of S)
16. 200 N
17. a) 30 N  
b) 29 N  
c) 21 N  
d) 15 N  
e) 0 N
18. a)  $F_h = 48$  N  
 $F_v = 82$  N  
b)  $F_h = 82$  N  
 $F_v = 48$  N