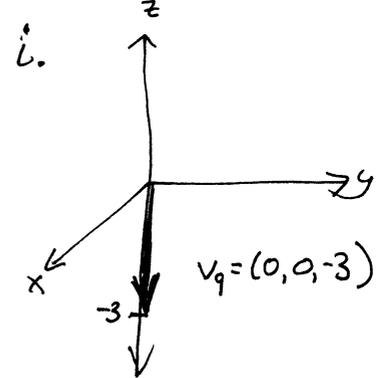
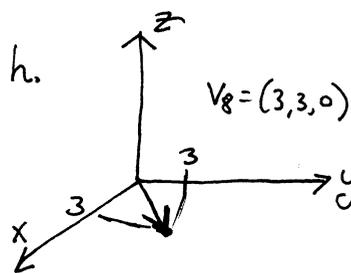
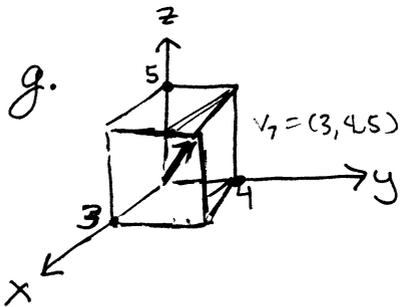
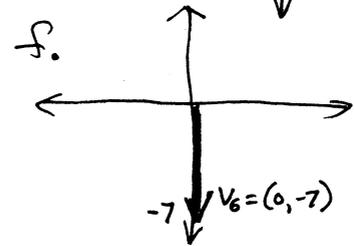
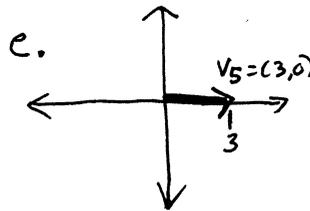
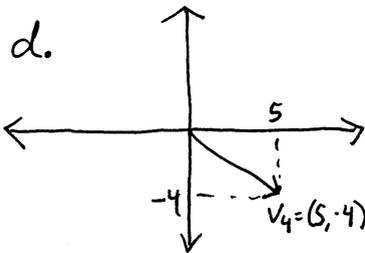
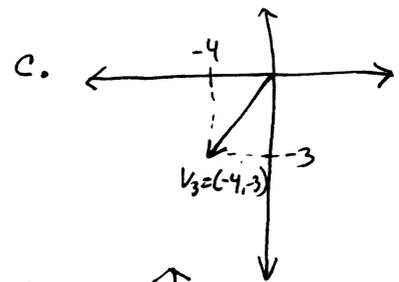
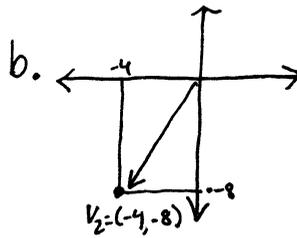
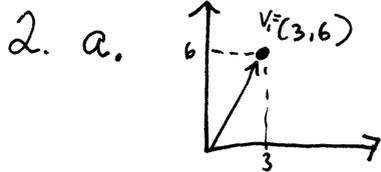


# Math 20 3.1 Solutions.



3. a.  $(3-4, 7-8) = (-1, -1)$       b.  $(-4-3, -7+5) = (-7, -2)$   
 c.  $(-3+5, 1-0) = (2, 1)$       d.  $(a-0, b-0) = (a, b)$   
 e.  $(-2-3, 5+7, -4-2) = (-5, 12, -6)$       f.  $(0+1, -1-0, 0-2) = (1, -1, -2)$   
 g.  $(0-a, 0-b, 0-c) = (-a, -b, -c)$       h.  $(a-0, b-0, c-0) = (a, b, c)$

4. a.  $(-1, 3, -5) + (6, 7, -3) = (5, 10, -8)$  is one possible answer (scalar multiples ok)  
 b.  $(-1, 3, -5) + (-6, -7, 3) = (-7, -4, -2)$  is one possible answer

6. a.  $v-w = (4-6, 0-(-1), -8-(-4)) = (-2, 1, -4)$   
 b.  $6u+2v = 6(-3, 1, 2) + 2(4, 0, -8) = (-18+8, 6+0, 12-16) = (-10, 6, -4)$   
 c.  $-v+u = (-4-3, 0+1, 8+2) = (-7, 1, 10)$   
 d.  $5(v-4w) = 5((4, 0, -8) - 4(-3, 1, 2)) = 5(4+12, 0-4, -8-8) = 5(16, -4, -16) = (80, -20, -80)$   
 e.  $-3(v-8w) = -3(4-48, 0+8, -8+32) = (132, -24, -72)$   
 f.  $(2u-7w) - (8v+u) = u-8v-7w = (-3, 1, 2) - 8(4, 0, -8) - 7(6, -1, -4) = (-3-32-42, 1-0+7, 2+64+28) = (-77, 8, 94)$