

17. 9 19. -12 21. (7, 0) 23. (4, 4) 25. (4, 2) 27. (6, 8); 10 29. a. (18, 18), (9, 9), (6, 6) b. (11, 12), (8, 9) 31. $|(ka, kb)| = \sqrt{(ka)^2 + (kb)^2} = \sqrt{k^2(a^2 + b^2)} = |k|\sqrt{a^2 + b^2} = |k| \cdot |(a, b)|$
 33. a. 1. Def. of vector sum 2. Subst. 3. $k[(a, b) + (c, d)] = k(a, b) + k(c, d)$ 4. Def. of vector sum
 b. Thm. 5-11

Mixed Review, Page 543

1. -2 2. 6; 6 3. 16 4. $a\sqrt{3}$ 5. 120 6. $2x; x\sqrt{3}$ 7. 45 8. (-3, 5) 9. 25
 10. 18 11. a. $(DE)^2 + (EF)^2 = 25 + 100 = 125$; $(DF)^2 = 121 + 4 = 125$ b. Slope of \overline{DE} · slope of $\overline{EF} = -\frac{4}{3} \cdot \frac{3}{4} = -1$ 12. a. $\frac{2}{3}$ b. $\frac{1}{4}$

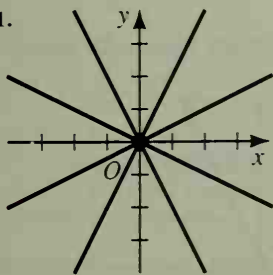
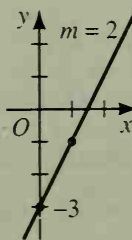
Written Exercises, Pages 545-547

1. (3, 3) 3. (0, -2) 5. (1.9, 0.4) 7. $2\sqrt{41}; \frac{-5}{4}; (-1, -3)$ 9. $17; -\frac{15}{8}; \left(-3, \frac{7}{2}\right)$ 11. (9, 5)
 13. 1. The midpt. of \overline{AB} is $M(4, 2)$. Slope of $\overline{AB} = \frac{4-0}{8-0} = \frac{1}{2}$, slope of $\overline{PM} = \frac{2-6}{4-2} = -2$;
 $\frac{1}{2}(-2) = -1$, so $\overline{PM} \perp \overline{AB}$. 2. $PA = 2\sqrt{10} = PB$, so P is on the \perp bis. of \overline{AB} . 15. $\left(-\frac{5}{2}, \frac{1}{2}\right), \left(\frac{11}{2}, \frac{1}{2}\right); 8$
 17. a. $\left(\frac{9}{2}, \frac{9}{2}\right)$ b. \square c. slope of $\overline{PQ} =$ slope of $\overline{OR} = \frac{3}{7}$; slope of $\overline{PO} =$ slope of $\overline{QR} = 3$ d. $PQ = OR = \sqrt{58}$; $PO = QR = 2\sqrt{10}$ 19. a. (-3, 4) b. 5; 5; 5 c. Thm. 5-15 d. $(x+3)^2 + (y-4)^2 = 25$
 21. a. $J\left(-\frac{1}{2}, \frac{3}{2}\right), K(3, 6), L\left(\frac{17}{2}, \frac{9}{2}\right); M(5, 0)$ b. rhom.; $JK = KL = LM = JM = \frac{\sqrt{130}}{2}$
 23. $\left(\frac{5}{8}x_1 + \frac{3}{8}x_2, \frac{5}{8}y_1 + \frac{3}{8}y_2\right)$

Self-Test 1, Page 547

1. a. 2 b. (4, 1) 2. a. 10 b. (4, -3) 3. a. $10\sqrt{2}$ b. (3, 2) 4. a. $\sqrt{29}$ b. $\left(-4, \frac{9}{2}\right)$
 5. $x^2 + y^2 = 81$ 6. $(x+1)^2 + (y-2)^2 = 25$ 7. (-2, 3); 6 8. $\frac{4}{7}$ 9. $-\frac{3}{5}$ 10. vertical
 11. a. 2 b. $-\frac{1}{2}$ 12. a. (6, -2) b. (-3, -3) c. (0, 4) 13. a. $2\sqrt{10}$ b. $3\sqrt{2}$ c. 4
 14. a. (4, -9) b. (22, -9) 15. (-15, 18)

Written Exercises, Pages 550-552

1.  7. -7; -21 13.  15. $m = -4, b = 0$
 9. 4; 6 17. $m = -\frac{2}{3}, b = -4$
 11. $4; \frac{5}{2}$ 19. $m = -4, b = 10$
 21. $m = \frac{5}{2}, b = -5$
 23. $m = \frac{1}{4}, b = -\frac{3}{2}$
 25. (1, 2) 27. (4, 3) 29. (2, -3) 31. a. Both have slope -2. b. No c. There is no sol.
 33. a. 2; $-\frac{1}{2}$ b. They are \perp ; 2 nonvert. lines are \perp iff the prod. of their slopes is -1. 35. b. (2, -1), (-1, 5), (-4, -4) c. $22\frac{1}{2}$ 37. (3, 4), (-5, 0)