

21E

$$\begin{aligned} 1) \quad 2Y &= X & Y &= 1/2 X + b \\ Y &= 1/2 X & (-3) &= 1/2 (-2) + b \\ m &= 1/2 & -2 &= b \end{aligned}$$

$$2) \quad Y = 1/2 X - 2$$

$$\begin{aligned} 3) \quad 2Y &= X - 4 \\ -X + 2Y &= -4 \text{ or } X - 2Y = 4 \end{aligned}$$

4) on the graph

$$5) \quad -Y = 2X \Rightarrow Y = -2X$$

$$6) \quad (0, 1), (-1, 0)$$

$$\begin{aligned} 7) \quad Y &\leq -2X & 0 &\leq -2(-1) \\ 1 &\leq 0 & 0 &\leq 2 \\ \text{no} & & \text{yes} & \end{aligned}$$

8) on the graph - solid line

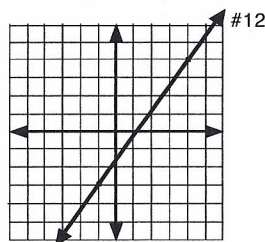
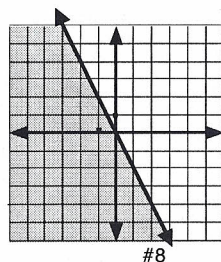
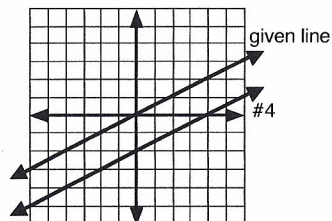
$$\begin{aligned} 9) \quad m &= \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{4 - (-3)}{4 - (-1)} = \frac{7}{5} = m \\ Y &= 7/5 X + b \Rightarrow (4) = 7/5 (4) + b \\ 20/5 &= 28/5 + b \\ b &= -8/5 \end{aligned}$$

$$10) \quad Y = 7/5 X - 8/5$$

$$11) \quad [-7/5 X + Y = -8/5] 5 \Rightarrow -7X + 5Y = -8$$

12) on the graph

$$\begin{array}{l} 13-15) \quad \begin{array}{|c|c|} \hline 60 \\ \hline D_P \quad D_F \end{array} \\ \left. \begin{array}{l} R_P = 4 \\ T_P = 12 \\ R_F = 8 \end{array} \right\} \begin{array}{l} D_P + D_F = 60 \\ R_P T_P + R_F T_F = 60 \\ (4)(12) + (8)(T_F) = 60 \\ 48 + 8T_F = 60 \\ 8T_F = 12 \\ T_F = 1 \frac{1}{2} \end{array} \end{array}$$



$$\begin{aligned} 16) \quad \frac{7.6 \cancel{\text{m}}}{1} \times \frac{1 \cancel{\text{m}}}{1} \times \frac{1 \cancel{\text{m}}}{1} \times \frac{100 \text{ cm}}{1 \cancel{\text{m}}} &= 7.6 \times 10^6 \text{ cm} \\ \frac{100 \text{ cm}}{1 \cancel{\text{m}}} \times \frac{100 \text{ cm}}{1 \cancel{\text{m}}} &= 7.6 \times 10^6 \text{ cm} \end{aligned}$$

$$17) \quad \frac{620 \cancel{\text{mi}}}{1} \times \frac{.62 \cancel{\text{mi}}}{1 \cancel{\text{mi}}} = 384.4 \text{ mi.}$$

$$18) \quad \frac{24}{24 + 5 + 35} = \frac{24}{64} = 37.5\%$$

$$19) \quad \frac{5}{64} = 7.8\%$$

$$20) \quad \frac{35}{64} = 54.7\%$$

22A

$$1) \quad d = \sqrt{\Delta X^2 + \Delta Y^2} \text{ or } d = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$$

$$2) \quad \left(\frac{X_1 + X_2}{2}, \frac{Y_1 + Y_2}{2} \right)$$

3) on the graph

$$4) \quad (AB)^2 = [(1) - (-2)]^2 + [(5) - (3)]^2 = (3)^2 + (2)^2 = 13$$

$$AB = \sqrt{13}$$

$$5) \quad (BC)^2 = [(3) - (1)]^2 + [(-2) - (5)]^2 = (2)^2 + (-7)^2 = 53$$

$$BC = \sqrt{53}$$

$$6) \quad (DE)^2 = [(-4) - (-1)]^2 + [(-3) - (5)]^2 = (-3)^2 + (-2)^2 = 13$$

$$DE = \sqrt{13}$$

7) on the graph

$$8) \quad (AB)^2 = [(3) - (-4)]^2 + [(2) - (4)]^2 = (7)^2 + (-2)^2 = 53$$

$$AB = \sqrt{53}$$

$$9) \quad (BC)^2 = [(5) - (3)]^2 + [(-3) - (2)]^2 = (2)^2 + (-5)^2 = 29$$

$$BC = \sqrt{29}$$

$$10) \quad (DE)^2 = [(-5) - (2)]^2 + [(-2) - (-3)]^2 = (-7)^2 + (1)^2 = 50$$

$$DE = \sqrt{50} = 5\sqrt{2}$$

11) on the graph

$$12) \quad \left(\frac{(-6) + (4)}{2}, \frac{(2) + (-3)}{2} \right) \text{ midpoint} = (-1, -1/2)$$

$$13) \quad \left(\frac{(-2) + (4)}{2}, \frac{(4) + (-3)}{2} \right) \text{ midpoint} = (1, 1/2)$$

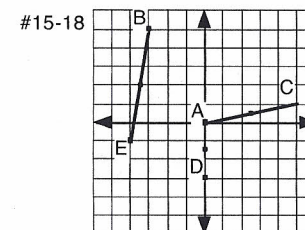
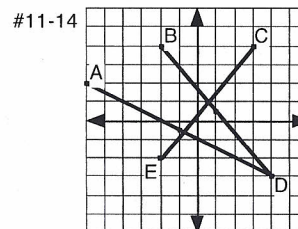
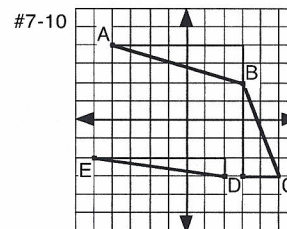
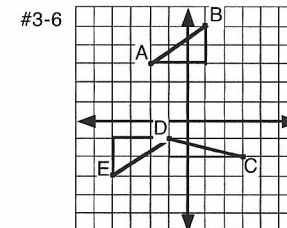
$$14) \quad \left(\frac{(-2) + (3)}{2}, \frac{(-2) + (4)}{2} \right) \text{ midpoint} = (1/2, 1)$$

15) on the graph

$$16) \quad \left(\frac{(0) + (5)}{2}, \frac{(0) + (1)}{2} \right) \text{ midpoint} = (5/2, 1/2)$$

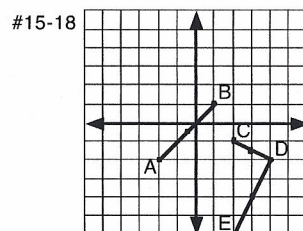
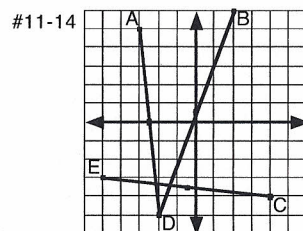
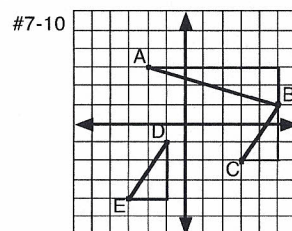
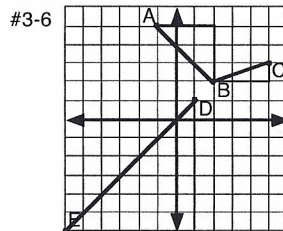
$$17) \quad \left(\frac{(-3) + (-4)}{2}, \frac{(5) + (-1)}{2} \right) \text{ midpoint} = (-7/2, 2)$$

$$18) \quad \left(\frac{(0) + (0)}{2}, \frac{(0) + (-3)}{2} \right) \text{ midpoint} = (0, -3/2)$$



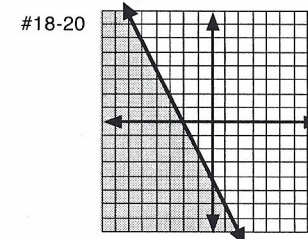
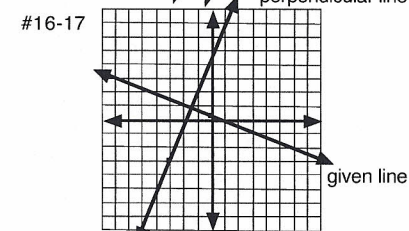
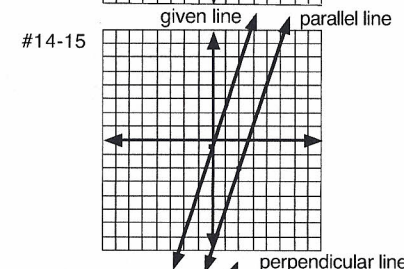
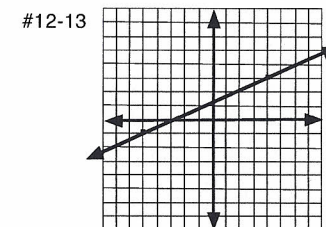
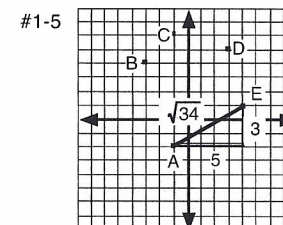
22B

- 1) $d = \sqrt{\Delta X^2 + \Delta Y^2}$ or $d = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$
- 2) $\left(\frac{X_1 + X_2}{2}, \frac{Y_1 + Y_2}{2} \right)$
- 3) on the graph
- 4) $(AB)^2 = [(2) - (-1)]^2 + [(2) - (5)]^2 = (3)^2 + (-3)^2 = 18$
 $AB = \sqrt{18} = 3\sqrt{2}$
- 5) $(BC)^2 = [(5) - (2)]^2 + [(3) - (2)]^2 = (3)^2 + (1)^2 = 10$
 $BC = \sqrt{10}$
- 6) $(DE)^2 = [(-6) - (1)]^2 + [(-6) - (1)]^2 = (-7)^2 + (-7)^2 = 98$
 $DE = \sqrt{98} = 7\sqrt{2}$
- 7) on the graph
- 8) $(AB)^2 = [(5) - (-2)]^2 + [(1) - (3)]^2 = (7)^2 + (-2)^2 = 53$
 $AB = \sqrt{53}$
- 9) $(BC)^2 = [(3) - (5)]^2 + [(-2) - (1)]^2 = (-2)^2 + (-3)^2 = 13$
 $BC = \sqrt{13}$
- 10) $(DE)^2 = [(-3) - (-1)]^2 + [(-4) - (-1)]^2 = (-2)^2 + (-3)^2 = 13$
 $DE = \sqrt{13}$
- 11) on the graph
- 12) $\left(\frac{(-3) + (-2)}{2}, \frac{(5) + (-5)}{2} \right)$ midpoint = $(-5/2, 0)$
- 13) $\left(\frac{(2) + (-2)}{2}, \frac{(6) + (-5)}{2} \right)$ midpoint = $(0, 1/2)$
- 14) $\left(\frac{(-5) + (4)}{2}, \frac{(-3) + (-4)}{2} \right)$ midpoint = $(-1/2, -7/2)$
- 15) on the graph
- 16) $\left(\frac{(-2) + (1)}{2}, \frac{(-2) + (1)}{2} \right)$ midpoint = $(-1/2, -1/2)$
- 17) $\left(\frac{(2) + (4)}{2}, \frac{(-1) + (-2)}{2} \right)$ midpoint = $(3, -3/2)$
- 18) $\left(\frac{(4) + (2)}{2}, \frac{(-2) + (-6)}{2} \right)$ midpoint = $(3, -4)$



22C

- 1-3) on the graph
- 4) 3, 5 (see graph)
- 5) $3^2 + 5^2 = AE^2$
 $9 + 25 = AE^2$ $AE = \sqrt{34}$
- 6) $AB^2 = [-1 - (-3)]^2 + [-2 - 4]^2 = 4 + 36 = 40$
 $AB = \sqrt{40}$ $AB = 2\sqrt{10}$
- 7) $BC^2 = [-1 - (-3)]^2 + [6 - 4]^2 = 2^2 + 2^2 = 8$
 $BC = \sqrt{8}$ $BC = 2\sqrt{2}$
- 8) $CE^2 = [-1 - 4]^2 + [6 - 1]^2 = 25 + 25 = 50$
 $CE = \sqrt{50}$ $CE = 5\sqrt{2}$
- 9) $\left(\frac{-3 + 4}{2}, \frac{-4 + 1}{2} \right) = \left(\frac{1}{2}, 2\frac{1}{2} \right)$
- 10) $\left(\frac{-3 + 3}{2}, \frac{-4 + 5}{2} \right) = \left(0, 4\frac{1}{2} \right)$
- 11) $\left(\frac{-1 - 1}{2}, \frac{-2 + 6}{2} \right) = (-1, 2)$
- 12) $m = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{-1 - 3}{-5 - 4} = \frac{4}{9}$
 $Y = 4/9 X + b \Rightarrow (3) = 4/9(4) + b$
 $27/9 = 16/9 + b$ $b = 11/9$
 $Y = 4/9 X + 11/9$
- 13) on the graph
- 14) $Y = 3X + b \Rightarrow (-2) = 3(+2) + b$
 $-8 = b$ $Y = 3X - 8$
- 15) on the graph
- 16) $m = -2/5$, so perpendicular is $5/2$
 $Y = 5/2 X + b \Rightarrow (-3) = 5/2(-3) + b$
 $-6/2 = -15/2 + b$ $b = 9/2$
 $Y = 5/2 X + 9/2$
- 17) on the graph
- 18) on the graph
- 19) $(0) \leq -2(0) - 4$ $(0) \leq -2(-4) - 4$
 $0 \leq -4$ $0 \leq 4$
 no yes
- 20) solid, on the graph



22D

1-3) on the graph

4) 4, 3 (see graph)

$$5) 3^2 + 4^2 = CD^2 \\ 25 = CD^2 \quad CD = 5$$

$$6) AD^2 = (-6 - 0)^2 + (6 - 0)^2 = 36 + 36 = 72 \\ AD = \sqrt{72} \quad AD = 6\sqrt{2}$$

$$7) CE^2 = [4 - (-5)]^2 + [3 - (-2)]^2 = 81 + 25 = 106 \\ CE = \sqrt{106}$$

$$8) BD^2 = (0 - 0)^2 + (0 - 5)^2 = 25 \\ BD = \sqrt{25} \quad BD = 5$$

$$9) \left(\frac{-6+0}{2}\right), \left(\frac{6+5}{2}\right) = \left(-3, 5\frac{1}{2}\right)$$

$$10) \left(\frac{0+(-5)}{2}\right), \left(\frac{5+(-2)}{2}\right) = \left(-2\frac{1}{2}, 1\frac{1}{2}\right)$$

$$11) \left(\frac{4+0}{2}\right), \left(\frac{3+0}{2}\right) = \left(2, 1\frac{1}{2}\right)$$

$$12) m = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{-3 - 3}{1 - (-4)} = -\frac{6}{5} \\ Y = -6/5 X + b \Rightarrow (3) = -6/5(-4) + b \\ 15/5 = 24/5 + b \quad b = -9/5 \\ Y = -6/5 X - 9/5$$

13) on the graph

$$14) Y = 2/3 X + b \Rightarrow (4) = 2/3(3) + b \\ b = 2 \quad Y = 2/3 X + 2$$

15) on the graph

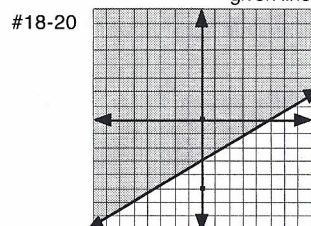
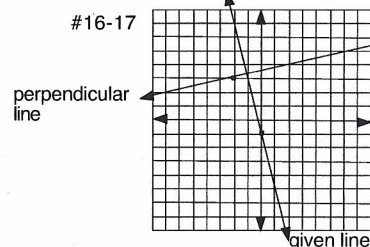
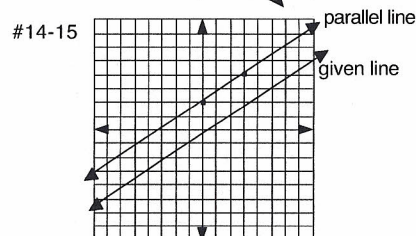
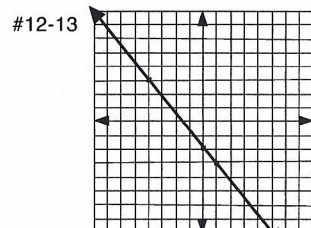
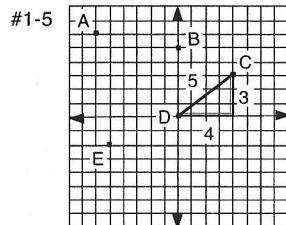
$$16) m = -4, \text{ so perpendicular is } 1/4 \\ Y = 1/4 X + b \Rightarrow (3) = 1/4(-2) + b \\ 3\frac{1}{2} = b \quad Y = 1/4 X + 3\frac{1}{2}$$

17) on the graph

$$18) \text{ on the graph} \\ [5Y \geq 3X - 15] \div 5 \Rightarrow Y \geq 3/5 X - 3$$

$$19) (0) \geq 3/5(0) - 3 \quad (-5) \geq 3/5(0) - 3 \\ 0 \geq -3 \quad \text{yes} \quad -5 \geq -3 \quad \text{no}$$

20) solid, on the graph



22E

1-3) on the graph

4) 4, 5 (see graph)

$$5) 4^2 + 5^2 = AE^2 \\ 16 + 25 = 41 \quad AE = \sqrt{41}$$

$$6) BD^2 = 1^2 + 9^2 = 1 + 81 = 82 \\ BD = \sqrt{82}$$

$$7) BC^2 = 3^2 + 3^2 = 18 \\ BC = \sqrt{18} \quad BC = 3\sqrt{2}$$

$$8) CE^2 = 5^2 + 10^2 = 125 \\ CE = \sqrt{125} \quad CE = 5\sqrt{5}$$

$$9) \left(\frac{-4+2}{2}\right), \left(\frac{-6-2}{2}\right) = (-1, -4)$$

$$10) \left(\frac{5-3}{2}\right), \left(\frac{-3+4}{2}\right) = \left(1, \frac{1}{2}\right)$$

$$11) \left(\frac{2-3}{2}\right), \left(\frac{-6+4}{2}\right) = \left(-\frac{1}{2}, -1\right)$$

$$12) m = \frac{-2-1}{-1-4} = \frac{-3}{-5} = \frac{3}{5} \\ Y = 3/5 X + b \Rightarrow (1) = 3/5(4) + b \\ 1 = 12/5 + b \quad b = -1\frac{2}{5} \\ Y = 3/5 X - 1\frac{2}{5}$$

13) on the graph

$$14) Y = 3X + b \Rightarrow (-3) = 3/4(1) + b \\ -3\frac{3}{4} = b \quad Y = 3/4 X - 3\frac{3}{4}$$

15) on the graph

$$16) m = -1/2, \text{ so perpendicular is } 2/1 \text{ or } 2 \\ Y = 2X + b \Rightarrow (3) = 2(0) + b \\ 3 = b \\ Y = 2X + 3$$

17) on the graph

$$18) \text{ on the graph} \\ [-4Y < 3X + 2] \div (-4) \Rightarrow Y > -3/4 X - 1/2$$

$$19) (1) > -3/4(1) - 1/2 \quad (-2) > -3/4(-2) - 1/2 \\ 1 > -1\frac{1}{4} \quad \text{yes} \quad -2 > 1 \quad \text{no}$$

20) dotted, on the graph

