

28A

$$\begin{array}{rcl}
 1) -5[N + D = 7] & \Rightarrow & -5N - 5D = -35 \\
 100[.05N + .10D = .45] & \Rightarrow & 5N + 10D = 45 \\
 \hline & & 5D = 10 \\
 & & D = 2 \\
 N + (2) = 7 & \Rightarrow & N = 5
 \end{array}$$

$$\begin{array}{rcl}
 2) -1[P + N = 24] & \Rightarrow & -P - N = -24 \\
 100[.01P + .05N = .56] & \Rightarrow & P + 5N = 56 \\
 \hline & & 4N = 32 \\
 & & N = 8 \\
 P + (8) = 24 & \Rightarrow & P = 16
 \end{array}$$

$$\begin{array}{rcl}
 3) -10[Q + D = 11] & \Rightarrow & -10Q - 10D = -110 \\
 100[.25Q + .10D = 2.15] & \Rightarrow & 25Q + 10D = 215 \\
 \hline & & 15Q = 105 \\
 & & Q = 7 \\
 (7) + D = 11 & \Rightarrow & D = 4
 \end{array}$$

$$\begin{array}{rcl}
 4) 2N + 3(N + 1) - (N + 2) = 21 \\
 2N + 3N + 3 - N - 2 = 21 \\
 4N = 20 \quad N = 5 \quad \text{integers} = 5, 6, 7
 \end{array}$$

$$\begin{array}{rcl}
 5) 8N - 2(N + 4) = 10 + (N + 2) \\
 8N - 2N - 8 = 12 + N \\
 5N = 20 \quad N = 4 \quad \text{integers} = 4, 6, 8
 \end{array}$$

$$\begin{array}{rcl}
 6) 3N + 4(N + 2) = -13(N + 4) \\
 3N + 4N + 8 = -13N - 52 \\
 20N = -60 \quad N = -3 \quad \text{integers} = -3, -1, 1
 \end{array}$$

$$\begin{array}{rcl}
 7) -80[M_1 + M_2 = 10 \text{ lbs}] \\
 100[.80M_1 + .90M_2 = .85(10)] \\
 \hline -80M_1 - 80M_2 = -800 \\
 80M_1 + 90M_2 = 850 \\
 \hline 10M_2 = 50 \\
 M_2 = 5 \text{ lbs.}, \quad M_1 = 5 \text{ lbs.}
 \end{array}$$

$$\begin{array}{rcl}
 8) -1[S_1 + S_2 = 65 \text{ ml}] \\
 100[.10S_1 + .01S_2 = .09(65)] \\
 \hline -S_1 - S_2 = -65 \\
 10S_1 + S_2 = 585 \\
 \hline 9S_1 = 520 \\
 S_1 = 57.78 \text{ ml}, \quad S_2 = 7.22 \text{ ml}
 \end{array}$$

28B

$$\begin{array}{rcl}
 1) -5[N + D = 15] & \Rightarrow & -5N - 5D = -75 \\
 100[.05N + .10D = 1.15] & \Rightarrow & 5N + 10D = 115 \\
 \hline & & 5D = 40 \\
 & & D = 8 \\
 N + (8) = 15 & \Rightarrow & N = 7
 \end{array}$$

$$\begin{array}{rcl}
 2) -5[Q + N = 30] & \Rightarrow & -5Q - 5N = -150 \\
 100[.25Q + .05N = 4.30] & \Rightarrow & 25Q + 5N = 430 \\
 \hline & & 20Q = 280 \\
 & & Q = 14 \\
 (14) + (N) = 30 & \Rightarrow & N = 16
 \end{array}$$

$$\begin{array}{rcl}
 3) -1[D + P = 14] & \Rightarrow & -D - P = -14 \\
 100[.10D + .01P = .68] & \Rightarrow & 10D + P = 68 \\
 \hline & & 9D = 54 \\
 & & D = 6 \\
 (6) + P = 14 & \Rightarrow & P = 8
 \end{array}$$

$$\begin{array}{rcl}
 4) 4N + 8(N + 1) + 64 = 4(N + 2) \\
 4N + 8N + 8 + 64 = 4N + 8 \\
 8N = -64 \quad N = -8 \quad \text{integers} = -8, -7, -6
 \end{array}$$

$$\begin{array}{rcl}
 5) 2(N + 2) - N + 26 = 3(N + 4) \\
 2N + 4 - N + 26 = 3N + 12 \\
 -2N = -18 \quad N = 9 \quad \text{integers} = 9, 11, 13
 \end{array}$$

$$\begin{array}{rcl}
 6) 3N + 6(N + 2) = 8(N + 4) - 14 \\
 3N + 6N + 12 = 8N + 32 - 14 \\
 N = 6 \quad \text{integers} = 6, 8, 10
 \end{array}$$

$$\begin{array}{rcl}
 7) -45[M_1 + M_2 = 60 \text{ lbs}] \\
 100[.65M_1 + .45M_2 = .50(60)] \\
 \hline -45M_1 - 45M_2 = -2700 \\
 65M_1 + 45M_2 = 3000 \\
 \hline 20M_1 = 300 \\
 M_1 = 15 \text{ lbs.}, \quad M_2 = 45 \text{ lbs.}
 \end{array}$$

$$\begin{array}{rcl}
 8) -5[S_1 + S_2 = 80 \text{ liters}] \\
 100[.15S_1 + .05S_2 = .07(80)] \\
 \hline -5S_1 - 5S_2 = -400 \\
 15S_1 + 5S_2 = 560 \\
 \hline 10S_1 = 160 \\
 S_1 = 16 \text{ liters}, \quad S_2 = 64 \text{ liters}
 \end{array}$$

28C

$$\begin{array}{rcl}
 1) -1[N + P = 27] & \Rightarrow & -N - P = -27 \\
 100[.05N + .01P = .75] & \Rightarrow & 5N + P = 75 \\
 \hline & & 4N = 48 \Rightarrow N = 12
 \end{array}$$

$$\begin{array}{rcl}
 2) P = 15 \\
 \text{check: } 12(.05) + 15(.01) = .60 + .15 = .75 \Rightarrow .75 = .75
 \end{array}$$

$$\begin{array}{rcl}
 3) N, N + 1, N + 2 \\
 4(N + 2) - 5(N) - (N + 1) = 5 \\
 4N + 8 - 5N - N - 1 = 5 \\
 -2N = -2 \Rightarrow N = 1
 \end{array}$$

$$\begin{array}{rcl}
 4) 1, 2, 3 \\
 \text{check: } 4(3) - 5(1) - (2) = 5 \Rightarrow 5 = 5
 \end{array}$$

$$\begin{array}{rcl}
 5) N, N + 2, N + 4 \\
 5(N + 4) - 6(N) = (N + 2) - 14 \\
 5N + 20 - 6N = N - 12 \\
 32 = 2N \Rightarrow N = 16
 \end{array}$$

$$\begin{array}{rcl}
 6) 16, 18, 20 \\
 \text{check: } 5(20) - 6(16) = (18) - 14 \Rightarrow 4 = 4
 \end{array}$$

$$\begin{array}{rcl}
 7) N, N + 2, N + 4 \\
 9(N + 4) - 3(N + 2) = 8(N) + 4 \\
 9N + 36 - 3N - 6 = 8N + 4 \\
 6N + 30 = 8N + 4 \\
 26 = 2N \Rightarrow N = 13
 \end{array}$$

$$\begin{array}{rcl}
 8) 13, 15, 17 \\
 \text{check: } 9(17) - 3(15) = 8(13) + 4 \\
 108 = 108
 \end{array}$$

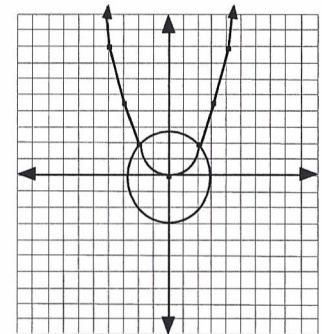
$$\begin{array}{rcl}
 9) B_T = 2\%, B_F = 5\%, B_H = 3\% \\
 [B_T + B_F = 50] \times (-2) \Rightarrow \\
 \hline [0.02B_T + 0.05B_F = .03(50)] \times (100) \Rightarrow 2B_T + 5B_F = 150 \\
 \hline 3B_F = 50 \\
 B_F = 16 \frac{2}{3}
 \end{array}$$

$$10) B_T = 33 \frac{1}{3}$$

$$\begin{array}{rcl}
 11) W_F = 95\%, W_E = 98\%, W_S = 97\% \\
 [W_E + W_F = 50] \times (-95) \Rightarrow -95W_E - \\
 \hline [0.98W_E + 0.95W_F = .97(50)] \times (100) \Rightarrow 98W_E + 95W_F = 4850 \\
 \hline 3W_E = 100 \\
 W_E = 33 \frac{1}{3}
 \end{array}$$

$$12) W_F = 16 \frac{2}{3}$$

#14



$$13) \text{ circle and parabola} \\ 2Y - X^2 = 0 \Rightarrow X^2 = 2Y$$

$$14) \text{ on the graph}$$

$$15) X^2 + Y^2 = 8 \\ -X^2 + 2Y = 0 \\ \hline Y^2 + 2Y = 8$$

$$16) Y^2 + 2Y - 8 = 0 \\ (Y + 4)(Y - 2) = 0 \\ Y = -4, 2$$

$$17) 2Y = X^2 \quad 2Y = X^2 \\ 2(-4) = X^2 \quad 2(2) = X^2 \\ \text{no solution} \quad X = \pm 2$$

$$18) (2, 2) \quad (-2, 2)$$

28D

$$\begin{array}{rcl} 1) -5[N + D = 11] & \Rightarrow & -5N - 5D = -55 \\ 100[.05N + .10D = .70] & \Rightarrow & 5N + 10D = 70 \\ \hline & & 5D = 15 \Rightarrow D = 3 \end{array}$$

2) $N = 8$
check: $8(.05) + 3(.10) = .70 \Rightarrow .70 = .70$

3) $N, N + 1, N + 2$
 $5(N + 1) - 7(N) - 3(N + 2) = 19$
 $5N + 5 - 7N - 3N - 6 = 19$
 $-5N = 20 \Rightarrow N = -4$

4) -4, -3, -2
check: $5(-3) - 7(-4) - 3(-2) = 19 \Rightarrow 19 = 19$

5) $N, N + 2, N + 4$
 $6(N) - 8(N + 2) = 12$
 $6N - 8N - 16 = 12$
 $-2N = 28 \Rightarrow N = -14$

6) -14, -12, -10
check: $6(-14) - 8(-12) = 12 \Rightarrow 12 = 12$

7) $N, N + 2, N + 4$
 $(N) + (N + 2) + (N + 4) = -15$
 $3N + 6 = -15$
 $3N = -21 \Rightarrow N = -7$

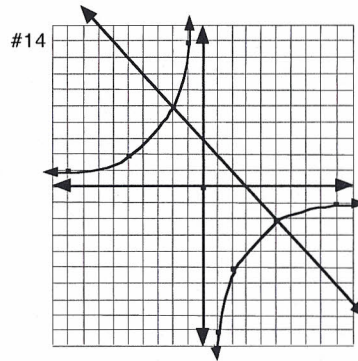
8) -7, -5, -3
check: $(-7) + (-5) + (-3) = -15$
 $-15 = -15$

9) $C_S = 7\%$, $C_T = 3\%$, $C_F = 4\%$
 $[C_S + C_T = 100] \times (-7) \Rightarrow$
 $-7.07\hat{C}_S + .03\hat{C}_T = .04(100) \times (100) \Rightarrow$
 $7C_S + 3C_T = 400$
 $C_T = 75$
 $-4C_T = -300$

10) $C_S = 25$

$$\begin{array}{rcl}
 11) \quad W_T = 93\%, W_V = 97\%, W_X = 96\% & & \\
 [W_T + W_V = 100] \times (97) & \Rightarrow & -97W_T - 97W_V = -9700 \\
 [.93W_T + .97W_V = .96(100)] \times (100) & \Rightarrow & 93W_T + 97W_V = 9600 \\
 & & \hline
 W_T = 25 & & -4W_T = -100
 \end{array}$$

12) $W_V = 75$



13) line and hyperbola hyperbola

X	Y
-10	+1
-1	+10
-5	+2
-2	+5

14) on the graph

15) $XY = -10$ -2
 $X(-X + 3) = -10$ substitution

$$\begin{aligned} 16) \quad & -X^2 + 3X + 10 = 0 \\ & X^2 - 3X - 10 = 0 \\ & (X - 5)(X + 2) = 0 \\ & X = 5, -2 \end{aligned}$$

$$\begin{array}{ll} 17) \quad Y = -(-2) + 3 & Y = -(5) + 3 \\ & Y = 5 & Y = -2 \end{array}$$

18) $(5, -2)$ $(-2, 5)$

28E

$$\begin{array}{rclcl} 1) \quad -10[D + Q = 14] & \Rightarrow & -10D - 10Q = -140 & \#14 \\ 100[.10D + .25Q = 2.30] & \Rightarrow & 10D + 25Q = 230 & \\ \hline & & 15Q = 90 & \Rightarrow Q = 6 \end{array}$$

2) $D = 8$
check: $.10(8) + .25(6) = .80 + 1.50 \Rightarrow 2.30 = 2.30$

3) $N, N + 1, N + 2$
 $7(N) + 2(N + 1) = 6(N + 2) + 8$
 $9N + 2 = 6N + 12 + 8$
 $9N + 2 = 6N + 20 \Rightarrow N = 6$

4) 6, 7, 8
check: $7(6) + 2(7) = 6(8) + 8 \Rightarrow 56 = 56$

5) $N, N + 2, N + 4$
 $3(N) - 7(N + 2) = 2$
 $-4N - 14 = 2$
 $-4N = 16 \Rightarrow N = -4$

6) -4, -2, 0
check: $3(-4) - 7(-2) = 2 \Rightarrow 2 = 2$

7) $N, N + 2, N + 4$
 $5(N) - 3(N + 4) = (N + 2) + 1$
 $5N - 3N - 12 = N + 3$
 $2N - 12 = N + 3$
 $N = 15$

8) 15, 17, 19
check: $5(15) - 3(19) = 17 + 1$
 $18 = 18$

9) $R_S = 60\%$, $R_T = 20\%$, $R_F = 50\%$

$$[R_S + R_T = 20] \times (-20) \Rightarrow$$

$$[-60R_S + 20R_T = -50(20)] \times (100) \Rightarrow 60R_S + 20R_T = 1000$$

$$40R_S = 600$$

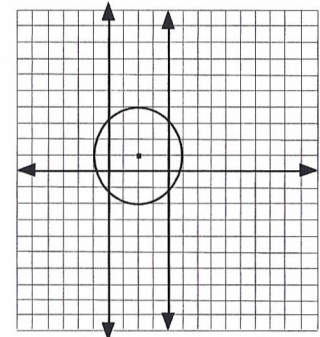
$R_S = 15$

10) $R_S = 15, R_T = 5$

11) $M_F = 40\%$, $M_E = 80\%$, $M_H = 50\%$

$$\begin{array}{rcl} [M_F + M_E = 20] \times (-8) & \Rightarrow & -8M_F - 8M_E \\ [2M_F + .8M_E = .5(20)] \times (10) & \Rightarrow & 4M_F + 8M_E = 100 \\ \hline M_F = 15 & & -4M_F \quad = -60 \end{array}$$

12) $M_F = 15, M_E = 5$



13) circle and line

14) on the graph

15) $2(-4 + 2)^2 + 2(Y - 1)^2 = 18$
substitution

$$\begin{aligned} 16) \quad & 2(4) + 2(Y - 1)^2 = 18 \\ & 2(Y - 1)^2 = 10 \\ & (Y - 1)^2 = \frac{5}{2} \\ & Y - 1 = \pm \sqrt{\frac{5}{2}} \\ & Y = 1 \pm \sqrt{\frac{5}{2}} \end{aligned}$$

17) $X = -4$

18) $(-4, 1 + \sqrt{5})$ $(-4, 1 - \sqrt{5})$
 $\sqrt{5} \approx 2.25$