1.6 p67

(7) n ≡ integer

$n + (n+1) + (n+2)$

(8) n ≡ middle integer

$(n-1) + (n) + (n+1)$

(9) s ≡ third test score

$$\frac{78 + 82 + s}{3}$$

(10) $\frac{8+8+8+9}{4}$ or $\frac{3(8)+9}{4}$ or $\boxed{\frac{24+9}{4}}$

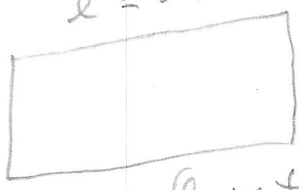
(11) $I = prt$ $p = x$, $r = 2\frac{1}{2}\% = 0.025$, $t = 1$

$\boxed{x(0.025)}$

(12) n ≡ # of months

$\boxed{\$795n}$

(13) $\ell = 3w$



Area = (length)(width)

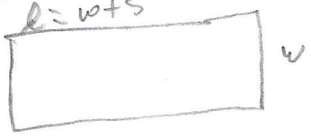
ℓw

$= 3w(w)$

$= \boxed{3w^2}$

(14) $P = 2\ell + 2w$

$\ell = w + 5$



$2(w+5) + 2w$

$= 2w + 10 + 2w$

$= \boxed{4w + 10}$

(15) $D = rt$

s ≡ rate or speed

$(45 \text{ min})\left(\frac{1 \text{ hr}}{60 \text{ min}}\right) = .75 \text{ hr}$

$(.75 \text{ hr})s$

$.75s$ or $\boxed{\frac{3}{4}s}$

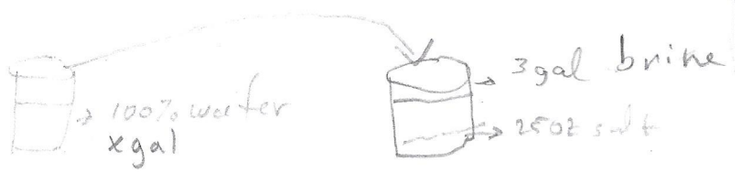
(16) $D = rt$

$t = \frac{D}{r}$

$\boxed{\frac{D}{55 \text{ mi/hr}}}$

1.6
p 69

(17) $x \equiv$ Volume of pure water added



$$\frac{25 \text{ oz}}{(3+x) \text{ gal}}$$

(18) $n \equiv$ # of nickels $q \equiv$ # of quarters
$p \equiv$ # of pennies
$d \equiv$ # of dimes

$n = 2p$

$d = n + 4 \rightarrow d = 2p + 4$

$q = d + n \rightarrow q = (2p+4) + 2p$

$q = 4p + 4$

$1¢(p) + (5¢)(2p) + (10¢)(2p+4) + (25¢)(4p+4)$

p: # of pennies; $2p$: # of nickels; $2p+4$: # of dimes; $4p+4$: # of quarters

$C \equiv$ Total cost
$d \equiv$ # of days $m \equiv$ # of miles

(19) $C = 65d + .20m$

$C = \$275$ $d = 3$ days so

$275 = 65(3) + .20m$

solve for m.

(20) $C \equiv$ Total cost
$x \equiv$ # of total text messages

$C = \$10 + \$0.10(x - 1000)$

$38.50 = 10 + .10x - 100$

$128.50 = .10x$

$x = 1285$ text messages

(21) $I = Prt$ $P \equiv$ Principale
$r \equiv$ yearly interest rate
$t \equiv$ # years

$P = \$12{,}000$

$r = .045$

12,000

$P_1 = x$ $P_2 = 12{,}000 - x$

$x \equiv$ Amount invested @ 4.5%

$12000 - x \equiv$ amount invested @ 4%

$I = I_{4.5\%} + I_{4.0\%}$

$= P_1 r_1 t_1 + P_2 r_2 t_2$

$= x(.045)(1) + (12000 - x)(.04)(1)$

$525 = .045x + 48 - .04x$

$525 = .005x + 480$

$45 = .005x$

$x = 9000 \therefore \$9000$ @ 4.5% and

$12{,}000 - 9000 = \$3{,}000$ @ 4.0%

1.6
p67

(22) $4000 @ 4% $x @ 5½%

total invested $(4000 + x)$

$$(4000+x)(.045) = .04(4000) + .055x$$

$$180 + .045x = 160 + .055x$$

$$20 = .010x$$

$$x = 2000 \quad \therefore \$2{,}000 \text{ invested @ } 5.5\%$$

$\$(4000 + 2000)$ invested @ 4.5 %

(23) $I = Prt$ I = Interest earned, P = Principal, r = Annual interest rate, t = # of years

$$262.50 = 3{,}500\, r(1)$$

$$\frac{262.50}{3500} = r$$

(24)

1.6
p67

(24) x = Interest rate (in decimal form) $1000 was invested at

$\$1000x + \$2000(x + .005) = \$190$

$\$3000x + \$10 = \$190$

$x = .06$ or 6%

(25) S = Amount of monthly salary.

Annual Pay = $12S + \$8500$

$\$97,300 = 12S + \$8500$

⋮

(26) H = amount Husband makes

W = " Woman makes

$\therefore W = 1.15H$

$100\% + 15\% = 115\%$

$\frac{115}{100} = 1.15$

Sum of salaries = $H + W$

$69,875 = H + 1.15H$

$69,875 = 2.15H$

$H = \$32,500$

$1.15H = 1.15(32,500)$

$W = \$37,375$

(27) U = amount $ inherited from Uncle

B = amount $ Befor Doubling

T = Total $ After Doubling

$B = U + 22,000$

D = Amount $ after Doubling

$D = 2(u + 22,000)$

$T = D$

$T = 2u + 44,000$

$134,000 = 2u + 44,000$

$90,000 = 2u$

$u = \$45,000$

1.6 p67

(28) $x \equiv$ # of weekly hours worked

$T \equiv$ Total Pay

$(1.5)(\$7.50)(x-35) + \$7.50(35) = \$352.50$

Overtime pay + regular pay = Total Pay

$\$11.25x - \$393.75 + \$262.50 = \$352.50$

$\$11.25x - \$131.25 = \$352.50$

$\$11.25x = \$483.75$

$x = 43$ hours worked

Overtime hours $= 43 - 35$ hrs

$= \boxed{8 \text{ hrs}}$

(29) $P \equiv$ # hours plumber worked $\quad \$45P \equiv$ Amount plumber earns

$A \equiv$ # " Assistant " $\quad \$25A \equiv$ Amount Assistant earns

$T \equiv$ Total hours

$P = 2A$

Cost $= \$45P + \$25A$

$4025 = \$45(2A) + \$25A$

$\$4025 = \$115(A)$

$\boxed{A = 35 \text{ hours}}$ ∴

$P = 2A$

$= 2(35)$

$\boxed{P = 70 \text{ hrs}}$

1.6 PG7

(30)

F ≡ Father's current age

D ≡ Daughter's current Age

D+6 ≡ Daughter Age in 6 years

F+6 ≡ Father's Age in 6 years

$F = 4D$

$F+6 = 3(D+6)$

$\therefore$

$4D+6 = 3D+18$

$D = 12$ yrs

(31)

A ≡ Acters current age

D ≡ Daughters current age

A-7 ≡ Age 7 yrs ago

D-7 ≡ Age 7 yrs ago

$A-7 = 11(D-7)$

$A = 4D$

$\therefore$

$4D-7 = 11D-77$

$70 = 7D$

$D = 10$

$\therefore A = 4(10)$

$= 40$ yrs

1.6
p68

(32) $H \equiv$ # HR hit by Hank
$B \equiv$ # HR " " Babe

$H = B + 41$

$H + B = 1469$

$\therefore B + 41 + B = 1469$

$2B = 1428$

$B = \boxed{714 \text{ home runs}}$

$H = 714 + 41$

$= 755$ home runs

(33) $p \equiv$ # of pennies
$n \equiv$ # of nickles
$d \equiv$ # of dimes
$q \equiv$ # of quarters

(1¢) $p \equiv$ Value of pennies
(5¢) $n =$ Value of nickels
(10¢) $d =$ " " dimes
(25¢) $q =$ " " quarters

$p = n = d$

$(1¢)p + (5¢)n + (10¢)d = 144¢$

$(1¢)p + (5¢)p + (10¢)d = 144¢$

$(16¢)p = 144¢$

$\boxed{\begin{array}{l} p = 9 \\ \therefore \\ n = 9 \\ d = 9 \end{array}}$

(34) $d = 2q$

$n = d + 5$

$300¢ = (5¢)n + (10¢)d + (25¢)q$

$300¢ = (5¢)(2q+5) + (10¢)(2q) + (25¢)(q)$

$= 10¢q + 25¢ + 20¢q + 25¢q$

$300¢ = (55¢)q + 25¢$

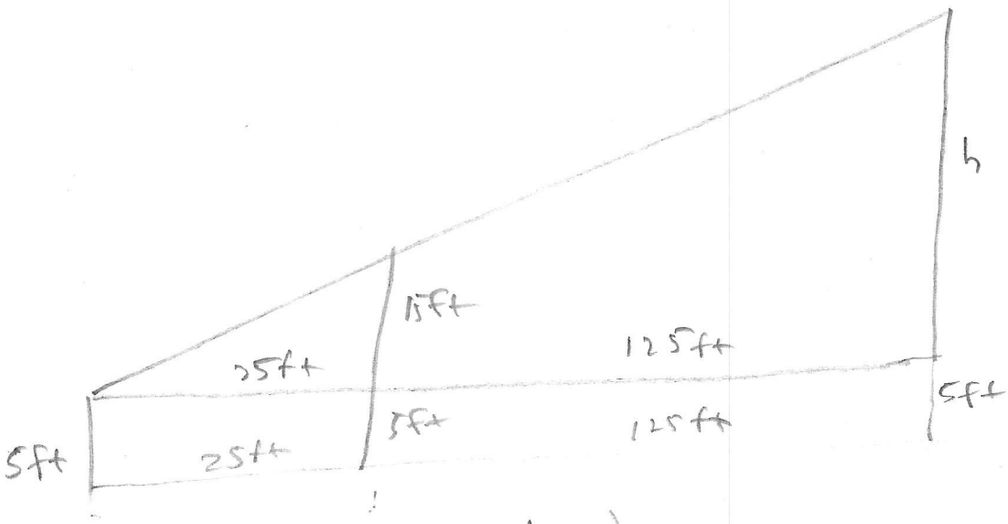
$275¢ = (55¢)q$

$\boxed{q = 5}$

$\boxed{d = 2(5) = 10}$

$\boxed{n = 10 + 5 = 15}$

4.6
P. 69
52



$150\left(\frac{15}{25} = \frac{h}{150}\right)$

$90 = h$

$h + 5 = \boxed{95\text{ ft}}$

1.6
p69

(53)

$x \equiv$ # total mL of 60% acid Solution

$y \equiv$ # total mL of 30% " "

$x + y = 300\text{mL} \Rightarrow y = 300\text{mL} - x$

$.60x + .30y = .50(300\text{mL})$

$.60x + .30(300\text{mL} - x) = 150\text{mL}$

$.60x + 90\text{mL} - .30x = 150\text{mL}$

$\frac{.30x}{.30} = \frac{60\text{mL}}{.30}$

$\boxed{x = 200\text{mL}}$

(61)

$\frac{(80)(20)}{70} + \frac{1}{80}(80)(20)\frac{1}{t} = \frac{1}{t}(70)(80)t$

$80t + 70t = 5600$

$150t = 5600$

$37.\overline{3}\text{ min}$

$= 37\frac{1}{3}\text{ min}$

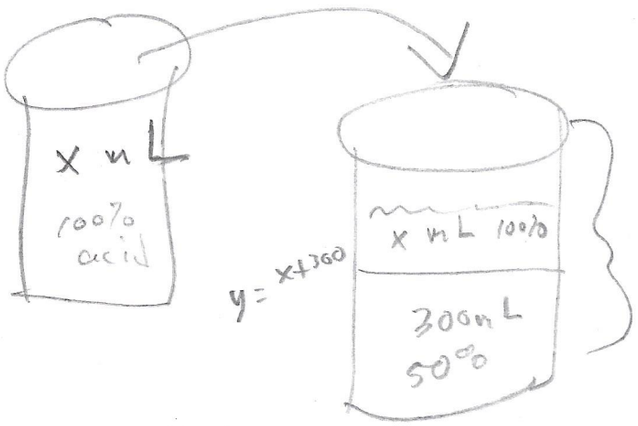
$\boxed{37\text{ min }20\text{sec}}$

1.6

(54)

$x \equiv$ Quantity of pure (100%) acid

$y \equiv$ Quantity of 60% sol



$1.00x + .50(300mL) = .60y$

$$1.00x + .50(300mL) = .60(x + 300mL)$$

$$1.00x + 150mL = .60x + 180mL$$

$$.40x = 30mL$$

$$\boxed{x = 75mL}$$

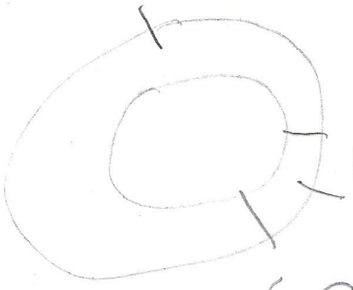
1.6
p69

(55) $5(18g) = 90g$ 10% Silver 90% Gold

$.90(90g) + 0(x) = .75(90+x)$

$81g + 1x = 67.5 + .75x$

$x =$ quantity of pure silver



$(.9)(90 \text{ grams}) = 81 \text{ grams of Gold}$

81 grams Gold + $.10(90 \text{ grams}) + .1x = .25(90+x)$

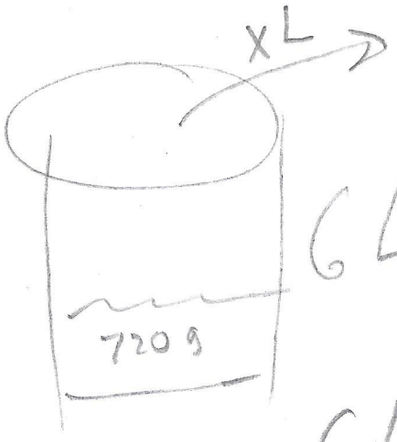
$9 + x = 22.5 + .25x$

$.75x = 13.5$

$x = 18$ grams

1.6
(56)

$x \equiv$ # of Liters Boiled off



$(6 - x)L$

$$6L\left(\frac{120\,g}{L}\right) - x\left(\frac{0\,g}{L}\right) = (6L - xL)\left(\frac{200\,g}{L}\right)$$

$$720\,g = 1200\,g - 200\,g\,x$$

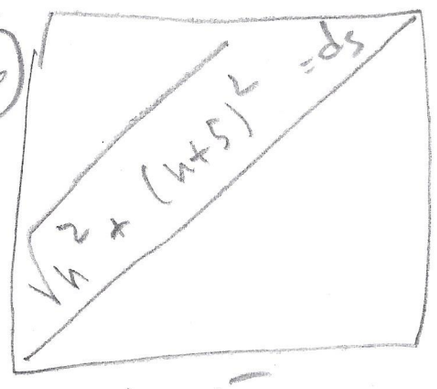
$$(200\,g)x = 1200\,g - 720\,g$$

$$x = \frac{480}{200}$$

$$x = 2.4\,L$$

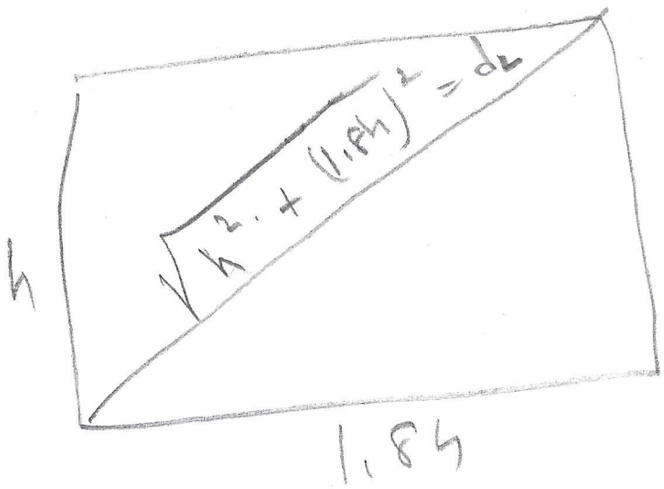
16

(66)



$$d_S = \sqrt{h^2 + h^2 + 10h + 25}$$

$$= \sqrt{2h^2 + 10h + 25}$$



$$d_L = \sqrt{h^2 + 3.24h^2}$$

$$= \sqrt{4.24h^2}$$

$$\doteq 2.06h$$

$$d_L = d_S + 14$$

$$2.06h = \sqrt{2h^2 + 10h + 25} + 14$$

$$(2.06h - 14) = \sqrt{2h^2 + 10h + 25}$$

$$(2.06h - 14)^2 = 2h^2 + 10h + 25$$

$$4.2436h^2 - 57.68h + 196 = 2h^2 + 10h + 25$$

$$2.2436h^2 - 67.68h + 171 = 0$$

Apply Quadratic Equation $h = 27.4$ or $h = 2.8$ too small