Getting Ready for Alg 2 – Prob. Solv. Day 1

① Let x = smaller #
$x+20$ = larger #

$4(x+20) = 70 + 5x$

$x = 10$

Ans: 10 & 30

Ck $4(30) = 120$ ✓
$70 + 5(10) = 120$

② Let x = small #
$3x+1$ = lg #

$8x - 2(3x+1) = 10$

Ans 6 & 19

Ck $48 - 38 = 10$ ✓

③ Let T = # of \$10 bills
$3T$ = # of \$5 bills
$3T+30$ = # of one \$ bills

$10T$ = value of
$5(3T)$ = value
$3T+30$ = value

$10T + 15T + 3T + 30 = 170$

$T = 5$

Ans: 5 \$10
15 \$5
45 \$1

Ck: 50
75
+ 45
170

④ Let N = # nickels → $5N$ = value
$N+5$ = # dimes → $10(N+5)$ = value
$N-16$ = # qtrs → $25(N-16)$ = value

$5N + 10(N+5) + 25(N-16) = 450$

$N = 20$

Ans: 20 nickels, 25 dimes, 4 qtrs.
Ck: \$1 + \$2.50 + 1.00 = 4.50 ✓

⑤ Let N = # nickels → $.05N$
$45-N$ = # dimes → $.10(45-N)$

$.05N + .10(45-N) = 3.50$

$N = 20$

Ans: 20 nickels, 25 dimes
Ck: $1.00 + 2.50 = 3.50$

⑥ Let x = # of 80¢ pd nuts
$30-x$ = # of 50¢ " "

$.8x + .5(30-x) = .75(30)$

$x = 25$

Ans: 25 pds @ 80¢
5 pds @ 50¢

Ck: $25(.80) + 5(.5) = 22.5$ ✓
$30(.75) = 22.5$

⑦ Let w = # pds of walnuts → $.75w$ = value
$(45-w)$ = # " " almonds → $1.20(45-w)$

$.75w + 1.20(45-w) = 1(45)$

$w = 20$

Ans: 20 pounds walnuts
25 " almonds

Ck: $20(.75) + 25(1.20) = \$45$ ✓

⑧ Let c = # of pounds @ 60¢
$90-c$ = # of pounds @ 87¢

$.6(c) + .87(90-c) = .69(90)$

$c = 60$

Ans: 60 pounds @ 60¢
30 pounds @ 87¢

Ck: $60(.6) + 30(.87) = 62.1$ ✓
$90(.69) = 62.1$

(9) let C = # of pounds @ $.95
(45-C) = " " " " 1.70

$.95C + 1.70(45-C) = 45(1.25)$
$C = 27$

Ans: 27 pounds @ $.95
18 pounds @ 1.70

ck: $25.65 + 30.60 = 56.25$ ✓
$45(1.25) = 56.25$

(10) Let X = # 5¢ bars
130-X = # 10¢ bars

$.05X + .10(130-X) = 9$
$X = 80$

Ans: 80 @ 5¢
50 @ 10¢

ck: $80(.05) + (50)(.10) = 9$ ✓

(11) let R = # dozen of roses
(14-R) = # dozen carnations

$3.5R + 2.5(14-R) = 43$
$R = 8$

Ans: 8 dozen roses
6 dozen carn.

ck: $3.50(8) + 2.50(6) =$
$43 = 43$ ✓
$8+6 = 14$ ✓

(12) Let A = # adult tix
478-A = # child tix

$.85A + .50(478-A) = 375.50$
$A = 390$

Ans: 390 adults, 88 children

(13) let C = # 65¢ pounds

$.65C + 10(.90) = .70(C+10)$
$C = 40$

Ans: 40 pounds

ck: $.65(40) = \$26$
$.90(10) = \$9$ } $35

$(40+10)(.70) = \$35$ ✓

(14) Let X = # 70¢ pounds

$.7X + 12(.50) = .65(12+X)$
$X = 36$

Ans: 36 pounds at 70¢

ck: $36(.70) + 12(.50) = 31.20$
$.65(48) = 31.20$ ✓

(15) Let X = amt invested at 5%
(4000-X) = " " " 3%

$.05X + .03(4000-X) = 152$
$X = 1600$

Ans: $1600 @ 5%
$2400 @ 3%

ck: $2400(.03) + 1600(.05) = 152$ ✓

(16) let X = amt invested at 4%
25000-X = " " " 7%

$.04X + .07(25000-X) = 1450$
$X = 10,000$

Ans: $10,000 at 4%
$15,000 @ 7%

ck: $\$40 + 1050 = \$1450$ ✓

(17) Let R = Robert's age
$2R$ = father's age

$$R-12 = \frac{1}{3}(2R-12)$$

$$R = 24$$

Ans: Robert is 24
Father is 48.

ck: $24-12 = \frac{1}{3}(48-12)$

$12 = 12$ ✓

(18) Let C = Mrs Cook's age
$C+20$ = Mrs Barry's

$$3(C-16) = C+20-16$$

$$C = 26$$

Ans: Mrs. Cook is 26.
Mrs. Barry is 46.

ck: $(26-16) \cdot (46-16)$

$10 \longleftrightarrow 30$

$3(10) = 30$ ✓

(19) Let F = Mrs. Fox
$3F$ = Mrs. Sanford

$$2(F+8)+14 = 3F+8$$

$$F = 22$$

Ans: Mrs. Fox is 22
Mrs. Sanf. is 66.

(20) Let W = width
$W+3$ = length
$W+3$ = side of square

$$(W+3)^2 = W(W+3)+24$$

$$W^2+6W+9 = W^2+3W+24$$

$$W = 5$$

Ans: width = 5, length = 8

(21) Let x = 1st cons. odd int.
$x+2$ = 2nd " " "
$x+4$ = 3rd " " "
$x+6$ = 4th " " "

$$x+x+2+x+4 = x+6+18$$

$$3x+6 = x+24$$

$$2x = 18$$

$$x = 9$$

Ans: 9, 11, 13, 15

ck: $9+11+13 = 33$ ✓
$15+18 = 33$

(22) Let x = 1st cons. even int.
$x+2$ = 2nd " "
$x+4$ = 3rd " " "

$$2(x+2+x+4) = 3x+34$$

$$x = 22$$

Ans: 22, 24, 26 ck: $100 \stackrel{\checkmark}{=} 3(22)+34$

(23) Let x = 1st con. int.
$x+1$ = 2nd
$x+2$ = 3rd

$$x+2(x+1) = x+2+24$$

$$x = 12$$

Ans: 12, 13, 14 ck:

(24) let x = # hrs.

$180x + 330x = 1530$

$x = 3$

Ans: In 3 hrs.

Ck: East $3(180) = 540$ miles
West $3(330) = 990$
1530

(25) let x = # hrs.

$42x + 48x = 390$

$x = 4\frac{1}{3}$

$4\frac{1}{3}$ = 4 hrs. 20 min.

Ans: 11:20 am

(26) Let x = # hrs.

$650x + 550x = 3000$

$x = 2\frac{1}{2}$

Ans: In $2\frac{1}{2}$ hrs.

(27) let x = harry's age
$x - 10$ = Mark's age

$x + 8 = 2(x - 10 - 3) + 4$

$x = 30$

harry = 30
Mark = 20

Ck: harry 8 yrs in future = 38
Mark 3 yrs ago = 17

$38 = 2(17) + 4$ ✓

(28) Let x = John's savings

$\frac{2}{3}x$ = Fred's

$\frac{x}{5}$ = Mary's

$x + \frac{2}{3}x + \frac{x}{5} = 14$

$15x + 10x + 3x = 210$

$x = 7.5$

John = $7.50
Fred = $5
Mary = $1.50

Ck: $7.50 + 5 + 1.50 = 14$ ✓

(29) Let x = son's share

$6x - 10{,}000$ = wife's

$x + 20{,}000$ = daughter's

$x + 6x - 10{,}000 + x + 20{,}000 = 90{,}000$

$x = 10{,}000$

Son = $10,000
wife = $50,000
daughter = 30,000