

$$\begin{aligned}
 (1) \quad & 3+2n < n \\
 & 3 < n-2n \\
 & 3 < -n \\
 & \underline{n > -3}
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & 5n-17 \leq 2n \\
 & 5n-2n \leq 17 \\
 & 3n \leq 17 \\
 & n \leq \frac{17}{3} \\
 & n \leq 5\frac{2}{3} \\
 & \underline{n \leq 5\frac{2}{3}} \quad \underline{n < 5}
 \end{aligned}$$

$$\begin{aligned}
 (5) \quad & 2n-10 > 5(n-15) \\
 & 2n-10 > 5n-75 \\
 & -10+75 > 5n-2n \\
 & 65 > 3n \\
 & \frac{65}{3} > n \\
 & \underline{n < \frac{65}{3}} \quad \underline{n < 21}
 \end{aligned}$$

$$\begin{aligned}
 (7) \quad & 2(3n)-4 = n-5 \\
 & 6n-4 = n-5 \\
 & 6n-n = -5+4 \\
 & 5n = -1 \\
 & \underline{n = -\frac{1}{5}}
 \end{aligned}$$

$$(9) \quad 3+4(5-n) = 3+2n$$

$$3+20-4n = 3+2n$$

$$23-4n = 3+2n$$

$$23-3 = 2n+4n$$

$$\frac{20}{6} = \frac{6n}{6}$$

$$n = \frac{20}{6} = \frac{10}{3} \text{ or } 3\frac{1}{3}$$

or

$$3+4(n-5) = 3+2n$$

$$3+4n-20 = 3+2n$$

$$4n-17 = 3+2n$$

$$4n-2n = 3+17$$

$$2n = 20$$

$$\underline{n = 10}$$

$$(11) \quad 7+2n \geq 15$$

$$2n \geq 15-7$$

$$2n \geq 8$$

$$\underline{n \geq 4}$$

$$(13) \quad 2n-5 \leq 2+2(n+4)$$

$$2n-5 \leq 2+2n+8$$

$$2n-5 \leq 2n+10$$

$$2n-2n \leq 10+5$$

$$\underline{n \leq 0}$$

$$(15) 5\% \text{ of } T = \text{Pine}$$

$$\frac{5}{100} \text{ of } T \leq 50$$

$$0.05T \leq 50$$

$$\underline{\underline{T \leq 1000 \text{ hee}}}$$

$$(17) \frac{8}{100} \text{ of USRDA Carbohydrates} = 24g$$

$$\frac{8}{100} \text{ USRDA for Carbohydrates} = 24g$$

$$0.08 \text{ USRDA for Carbohydrates} = 24g$$

$$\text{USRDA for Carbohydrates} = \frac{24}{0.08}g$$

$$= \underline{\underline{300g}}$$

$$(19) \text{ let the fleet be } F$$

$$\text{no aircraft carriers} = F - 2$$

$$89.5\% \text{ of } F = F - 2$$

$$0.895F = F - 2$$

$$2 = F - 0.895F$$

$$2 = 0.105F$$

$$\underline{\underline{F = 19 \text{ ships}}}$$

$$(21) \text{ No range quantity } = 35 - 30 = \underline{\underline{7.36\%}}$$

$$= 5 \text{ pressures}$$

$$\frac{5}{35} \times 100\% = \underline{\underline{14.286\%}}$$

$$(23) 37\% - \text{beef}$$

$$25\% - \text{fish}$$

$$32\% - \text{chicken}$$

$$\text{rest } [100 - (37 + 25 + 32)]$$

$$\text{Rest} - 6\% \text{ don't like meat}$$

$$\text{let the total number of}$$

$$\text{customers be } C = 97$$

$$\frac{37}{100} \times 97 = 35.89$$

$$\text{beef} = \frac{37}{100} \times 97 \approx 35.89$$

$$\text{beef customers} \approx \underline{\underline{36}}$$

$$(25) \text{ Total} = 253$$

$$\text{beef} = 75$$

$$\text{Percentage of beef customers}$$

$$= \frac{75}{253} \times 100\%$$

$$= \underline{\underline{29.64\%}}$$

$$\text{The estimate was close by}$$

$$= (37 - 29.64)\%$$

$$(27) \frac{10}{100} \text{ of } 6 = \text{Swice}$$

$$\frac{10}{100} \times 6 = 0.6 \text{ ounce of swice}$$

Add 2 ounces of water.

$$\text{Total volume} = 6 + 2 = 8 \text{ ounces}$$

$$\text{Swice} = 0.6 \text{ ounce}$$

$$\% \text{ of swice} = \frac{0.6}{8} \times 100\% = 7.5\%$$

$$(29) 1 \text{ gallon for } \frac{1}{2} \text{ cup bleach}$$

$$16 \text{ cups} = 1 \text{ gallon}$$

$$16 \text{ cups} + \frac{1}{2} \text{ cup} = \text{mixture}$$

$$= 16.5 \text{ cups}$$

$$\text{bleach} = 0.5$$

$$\% \text{ bleach} = \frac{0.5}{16.5} \times 100\% = 3.033$$

$$\approx \underline{\underline{3\%}}$$

$$(31) \frac{3}{4} - \text{presentation}$$

$$\text{Not used} = 72 \Rightarrow \frac{1}{4}$$

$$\frac{1}{4}x = 72$$

$$x = 288$$

$$\text{steak used} = \frac{3}{4} \times x$$

$$= \frac{3}{4} \times 288 = \underline{\underline{216 \text{ steak}}}$$

$$(33) 20\% \text{ of } 10 \text{ am.}$$

$$\text{Games am} = \frac{20}{100} \times 10$$

$$= 2 \text{ games}$$

$$\text{Games remaining} = 16 \text{ games}$$

$$\text{Total games} = 16 + 10 = 26 \text{ games}$$

$$60\% \text{ of total games}$$

$$\frac{60}{100} \times 26 = 15.6 \approx 16 \text{ games}$$

$$\text{No of games to win } 16 - 2$$

$$= \underline{\underline{14 \text{ games}}}$$

$$(35) x, x+1, x+2$$

$$x = 15 + ((x+1) + (x+2))$$

$$x = 15 + (x+1 + x+2)$$

$$x = 15 + (2x+3)$$

$$x = 15 + 2x + 3$$

$$x = 18 + 2x$$

$$-18 = x$$

$$\underline{\underline{-18, -17, -16}}$$

$$(37) x, x+1$$

$$x+1 = 2(x) - 12$$

$$x+1 = 2x - 12$$

$$1+12 = 2x - x$$

$$x = 13$$

$$\underline{\underline{13, 14}}$$

$$(39) x, x+2, x+4, x+6$$

$$2[(x+6) + (x+4)] = 46 - [x + (x+2)]$$

$$2\{x+6+x+4\} = 46 - \{x+x+2\}$$

$$2\{2x+10\} = 46 - \{2x+2\}$$

$$4x+20 = 46 - 2x+2$$

$$4x+20 = 48 - 2x$$

$$4x-2x = 48-20$$

$$2x = 28$$

$$x = 14$$

$$\underline{\underline{14, 16, 18, 20}}$$

$$(*)$$

$$(41) x, x+2, x+4$$

$$7(x) - 6 = 2\{(x+4) - (x+2)\} - 23$$

$$7x-6 = 2\{x+4-x-2\} - 23$$

$$7x-6 = 2\{2\} - 23$$

$$7x-6 = 4-23$$

$$7x = 4-23+6$$

$$7x = -13$$

$$x = \frac{-13}{7} = -1.857$$

$$\approx -1$$

$$\underline{\underline{-5, -3, -1}}$$

$$(43) x, x+2$$

$$x = 51 + 7(x+x+2)$$

$$x = 51 + 7(2x+2)$$

$$x = 51 + 14x + 14$$

$$x = 65 + 14x$$

$$x - 14x = 65$$

$$-13x = 65$$

$$x = -5$$

$$\Rightarrow \underline{\underline{-5, -3}}$$

$$(45) x, x+2, x+4, x+6$$

$$4+2(x+x+2) < 5 - (x+4+x)$$

$$4+2(2x+2) < 5 - (2x+10)$$

$$4+4x+4 < 5-2x-10$$

$$4x+8 < -15-2x$$

$$4x+2x < -15-8$$

$$\underline{6x} < \underline{-23}$$

$$\frac{6x}{6} < \frac{-23}{6}$$

$$x < -3.83$$

$$x < -4$$

$$\underline{\underline{-10, -8, -6, -4}}$$

(47) $2, x+2, x+4$

$2[(x+4)-2]-7 \leq 4+(x+2)$

$4-7 \leq 4+x+2$

$-3 \leq 6+x$

$-3-6 \leq x$

$-9 \leq x$

$x \geq -9$

$= -9, -7, -5$

(49) $x, x+1$

$x > 22 - 2(x+x+1)$

$x > 22 - 2(2x+1)$

$x > 22 - 4x - 2$

$x > 20 - 4x$

$x+4x > 20$

$5x > 20$

$x > 4$

5, 6

(51) $2(L+W) = 58 ; L = 14$

$2(14+W) = 58$

$28+2W = 58$

$2W = 58-28$

$2W = 30$

$W = 15$

width = 15 centimeters

(53) Circumference = $2\pi r = 8\pi$ yds

Area = πr^2

$2\pi r = 8\pi$

$r = 4$ yards

Area = $\pi (4)^2$

$= 16\pi$ yards squared

(55) Circumference = $\pi D = 2\pi r$

$r = (x+1)$ ft

$\frac{14\pi}{2\pi} = \frac{2\pi(x+1)}{2\pi}$

$7 = x+1 = r$

$D = 2r = 7 \times 2 = \underline{14 \text{ feet}}$

(57) $2(L+W) = 43$

$2(x-4)+2x = 43$

$2(x-4+2x) = 43$

$2(3x-4) = 43$

$6x-8 = 43$

$6x = 43+8$

$6x = 51$

$x = 8.5$ ft

$$\text{length} = 2 - 4 \\ = 8.5 - 4 = 4.5 \text{ feet}$$

$$\text{width} = 2x = 2(8.5) = 17 \text{ feet}$$

$$(59) \text{ volume} = V = Bh$$

$$B = \frac{1}{2} \times 3 \times 4^2 = 6m^2$$

$$h = (3y + 1)m$$

$$42 = 6 \times (3y + 1)$$

$$\frac{42}{6} = 3y + 1$$

$$7 = 3y + 1$$

$$6 = 3y$$

$$\underline{\underline{y = 2m}}$$

$$(6) A = \pi r^2 \quad 2r = D$$

$$25\pi = \pi r^2$$

$$r = 5$$

$$D = 2 \times 5 = \underline{\underline{10m}}$$

$$(63) 5 \text{ times} - \text{non poisonous} \text{ dose} \\ \text{dose poisonous}$$

$$\frac{5}{1}$$

$$\text{non poisonous dose}$$

$$5:1$$

$$\underline{\underline{5:6}}$$

$$(65) 2:5$$

$$\frac{2 \text{ inches}}{5 \text{ miles}} = \frac{13.5 \text{ miles}}{x \text{ miles}}$$

$$\frac{2}{5} = \frac{13.5}{x}$$

$$2x = 5 \times 13.5$$

$$2x = 67.5$$

$$x = \underline{\underline{33.75 \text{ miles}}}$$

$$(67) 1 \text{ gallon} - 25 \text{ miles city} \\ 1 \text{ gallon} - 35 \text{ miles highway}$$

$$\frac{1 \text{ gallon}}{25 \text{ miles}} = \frac{1.5 \text{ gallons}}{x \text{ miles}}$$

$$x = 15 \times 25$$

$$x = \underline{\underline{375 \text{ miles}}}$$

$$(69) 3:32$$

$$3 - \text{model}$$

$$32 - \text{real life}$$

$$\frac{3}{32} = \frac{17}{x}$$

$$3x = 17 \times 32$$

$$3x = 544$$

$$x = \underline{\underline{181.33 \text{ inches}}}$$

(71) $\frac{3}{5}$ brand A

brand A = $\frac{3}{5} \times 20 = 12$ bags

brand B = $\frac{2}{5} \times 20 = 8$ bags

(73) 4:11

$4n + 11n = 180^\circ$ (sum of angles on straight line)

$15n = 180^\circ$

$n = 12^\circ$

$\angle 1 = 4n = 48^\circ$

(75) 3:02 = \$0.95

$\frac{3}{0.95} = \frac{5}{x}$

$3x = 0.95 \times 5$

$3x = 4.75$

$x = \$1.583$

(77) 4:1

10:?

Water $\Rightarrow \frac{4}{1} = \frac{10}{x}$

$\frac{4x}{4} = \frac{10}{1} \quad x = 2.5$

Water = $2\frac{1}{2}$ cups

cooking oil $\frac{1}{4} = 0.25$

4:0.25:

10:?

$\frac{4}{0.25} = \frac{10}{x} \quad 4x = 10 \times 0.25$

$4x = 2.5$

$x = 0.625 = \frac{5}{8}$

cooking oil = $\frac{5}{8}$ cup.

Cupcake seasoning:

4:2

10:?

$\frac{4}{2} = \frac{10}{x}$

$4x = 2 \times 10$

$4x = 20$

$x = 5$

Cupcake seasoning = 5 tablespoons

(79) 2.25 - Bulter to Georgetown

Scale 1:20

$$\frac{1}{20} : \frac{1}{20} = \frac{2.25}{x}$$

$$x = 2.25 \times 20 \\ = \underline{45 \text{ miles in real life}}$$

(81) Completed passes: attempted

2:3

12 - not completed

$$\frac{2}{3} \text{ Not completed} = \frac{3}{5}$$

$$\frac{3}{5}x = 12$$

$$3x = 60$$

$$x = 20 \text{ total number of passes}$$

$$\text{Completed} = \frac{2}{5}$$

(81) Completed: Attempted

2:3

12 not completed

$$\text{Not completed} = \frac{1}{3}$$

$$\frac{1}{3}x = 12$$

$$x = 36 \text{ attempted passes}$$

$$\therefore \text{Completed} = \frac{2}{3} \times 36 = \underline{24 \text{ passes}}$$

(83) 2 ^{hit} pitches 3 ^{missed} no hit
total hits = 2+3 = 5

$$\text{hit} = \frac{2}{5} \times 24 = \underline{9.6 \approx 10}$$

(85) 16:15 : 14 minutes

x : y : 48 minutes

$$\frac{16}{x} = \frac{14}{48}$$

$$14x = 48 \times 16$$

$$14x = 768$$

$$x = 54.857$$

$$\approx 55$$

$$\frac{15}{y} = \frac{14}{48}$$

$$14y = 15 \times 48$$

$$14y = 720$$

$$y = 51.428$$

$$\approx 51$$

$$\text{Final score} = \underline{54 \text{ to } 51}$$

(87) Apple: Bananas

3:2

total 30

$$\text{Apples} = \frac{3}{5} \times 30 = \underline{\underline{18 \text{ Apples}}}$$

(89) Average = $\frac{\text{Sum of all}}{\text{number of items}}$

$$74 = \frac{518}{n}$$

$$74n = 518$$

$$n = \frac{518}{74} = \underline{\underline{7}}$$

(91) $n=7$ average = 9

$n=9$ average = 7

overall average

$$\text{Total for 7 number} = 7 \times 9 = 63$$

$$\text{Total for 9 number} = 9 \times 7 = 63$$

$$\text{Total} = 63 + 63 = 126$$

$$\text{Average} = \frac{126}{16}$$

$$= \underline{\underline{7.875}}$$

(93) 4 grades $\text{av} = 82$
6 grades $\text{av} = 92$

$$\text{For 4 grades} \Rightarrow \text{Total} = 4 \times 82 = 328$$

$$\text{For 6 grades} = 6 \times 92 = 552$$

$$\text{Sum} = 328 + 552 = 880$$

$$\text{Average} = \frac{880}{10} = \underline{\underline{88}}$$

(95) Av. 73.4 $n=5$

Sum

$$= 73.4 \times 5$$

$$= \underline{\underline{367}}$$

(97) 95, 90, 0, 91, 85, and x

Av. = 76

$$\text{Sum} = 95 + 90 + 0 + 91 + 85 + x$$

$$= 361 + x$$

$$n = 6$$

$$\text{Average} = \frac{\text{Sum}}{n}$$

$$76 = \frac{361 + x}{6}$$

$$456 = 361 + x$$

$$456 - 361 = x$$

$$x = 95$$

Next time he should score 95

(99) 3 test Ar-25

$$\text{Ar} = 80$$

$$3 \text{ Test Ar} = 3 \times 75 \\ = 225$$

Let the sum of the 2
test be x .

$$\therefore 80 = \frac{225 + x}{5}$$

$$400 = 225 + x$$

$$x = 400 - 225$$

$$x = 175$$

Average of the two tests

$$= \frac{x}{2} = \frac{175}{2}$$

$$= 87.5$$

(101) Sam = 8 games - average 2 hits
per game.

More hits to finish with

avg. of 1 hit per game

$$\text{Total games} = 20$$

Total for 8 games

$$= 8 \times 2 = 16 \text{ hits}$$

$$\text{Total hits} = 16 + x$$

$$x = 20$$

$$1 = \frac{16 + x}{20}$$

$$20 = 16 + x$$

$$x = 20 - 16$$

$$x = 4$$

He needs 4 hits to get
average of 1 hit per game.

(103) 9 hits - average 0.300

$$\frac{9}{x} = 0.3$$

$$9 = 0.3x$$

$$x = 30 \text{ at bats}$$

(105) Average score 0.250

50 at-bats.

$$\frac{x}{50} = 0.250$$

$$x = 50 \times 0.25$$

$$= 12.5$$

His average should be
over 12 hits

(107) $\text{Average} = 0.232$
 $\text{hrs} = 29$
 more hrs $\rightarrow$ rate to 0.360.

at lab

$$\frac{29}{x} = 0.232$$

$$29 = 0.232x$$

$$x = 125 \text{ at lab}$$

let the additional at lab be x

~~at lab~~

$$0.232 \cdot 29 \text{ hrs}$$

$$\frac{0.232}{29} = \frac{0.360}{x}$$

$$0.232x = 29 \times 0.360$$

$$0.232x = 10.44$$

$$x = 45 \text{ hrs}$$

$$\text{more hrs} = 45 - 29$$

$$= 16 \text{ hrs needed}$$

(109) $\text{Tests} = 35\%$
 $\text{Quizzes} = 30\%$
 $\text{H/W} = 20\%$
 $\text{Exam} = 15\%$

$$\text{Test} = 60, 85, 79, 80$$

$$\text{Quizzes} = 75, 98, 63, 76, 75, 83$$

$$\text{H/W} = 80, 90, 76, 83, 76, 91, 95$$

$$\text{Exam} = 73$$

$$\text{Average Test} = \frac{60 + 85 + 79 + 80}{4}$$

$$= 76$$

$$\text{Av. Quizzes} = \frac{75 + 98 + 63 + 76 + 75 + 83}{6}$$

$$= 78.33$$

$$\text{H/W} = \frac{80 + 90 + 76 + 83 + 76 + 91 + 95}{7}$$

$$= 85$$

$$\text{Exam} = 73$$

$$\text{Grade} = 0.35(76) + 0.3(78.33)$$

$$+ 0.2(85) + 0.15(73)$$

$$= 26.25 + 23.5 + 17 + 10.95$$

$$= 77.7$$

$$(111) \text{ Final} = 25\% \\ \text{score} = 75\%$$

$$\text{Before exam score} = 83\%$$

Since 2 exam to get
average 80.

$$\text{Merge} = (0.75 \times \text{before exam}) + (0.25 \times \text{Exam score})$$

$$80 = (0.75 \times 83) + (0.25x)$$

$$80 = 62.25 + 0.25x$$

$$16.25 = 0.25x$$

$$x = 65$$

He should score at least
65 in exam

113

$$(113) \begin{array}{l} 31.972 \text{ Syllabus 32} \\ 32.971 \text{ Syllabus 33} \end{array}$$

$$(113) \text{ Syllabus 32} \\ = 31.972 \times \frac{94.93}{100}$$

$$= 30.351$$

$$\text{Syllabus 33}$$

$$= 32.971 \times \frac{0.76}{100}$$

$$= 0.250$$

$$\text{Syllabus 34}$$

$$= 33.968 \times \frac{1.29}{100}$$

$$= 1.457$$

$$\text{Syllabus 36}$$

$$= 35.967 \times \frac{0.02}{100}$$

$$= 0.007$$

Approximate average mark

$$= 30.351 + 0.251 + 1.457 + 0.007$$

$$= 32.066$$

(15) Thomas : Tonga : Xavier

2 : 3 : 4

Money = 54.

$$\text{Thomas} = \frac{2}{2+3+4} \times 54$$

$$= \frac{2}{9} \times \frac{54}{1} = \underline{\underline{12}}$$

$$\text{Tonga} = \frac{3}{9} \times \frac{54}{1} = \underline{\underline{18}}$$

$$\text{Xavier} = \frac{4}{9} \times \frac{54}{1} = \underline{\underline{24}}$$

(17) Springfield series.

1 pt, 3 pt, 4 pt, 2 pts & 6 pt

More = 8 pts

*This is incorrect because there is more of the five games where the team score 8 points or more.