Revision I

HCFs

Ex1 Find the Highest Common Factor of 84 and 120

2, 3, 5, 7, 11, 13

$$\begin{array}{r|l} 2 & 84 \\ \hline 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 120 \\ \hline 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$84 = 2 \times 2 \times 3 \times 7$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

$HCF = 2 \times 2 \times 3$

$= 12$

Exercice Find HCF of

1) 54 and 36

$$\begin{array}{r|l} 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$54 = 2 \times 3 \times 3 \times 3$

$36 = 2 \times 2 \times 3 \times 3$

$HCF = 2 \times 3 \times 3$

$= 18$

2) 100 and 140

$$\begin{array}{r|l} 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 140 \\ \hline 2 & 70 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$100 = 2 \times 2 \times 5 \times 5$

$140 = 2 \times 2 \times 5 \times 7$

$HCF = 2 \times 2 \times 5$

$= 20$

Mixed Number Arithmetic

Addition

$$3\tfrac{4}{5} + 1\tfrac{2}{7}$$

$$= 4\,\frac{28+10}{35}$$

$$= 4\,\frac{38}{35}$$

$$= 5\,\frac{3}{35}$$

Subtraction

$$6\tfrac{1}{3} - 4\tfrac{4}{5}$$

15t

$$= 1\,\frac{5-12}{15}$$

$$= 1\,\frac{8}{15}$$

Multiplication

$$3\tfrac{3}{4} \times 1\tfrac{1}{5}$$

$$= \frac{\cancel{15}^{\,3}}{\cancel{4}_{\,2}} \times \frac{\cancel{6}^{\,3}}{\cancel{5}_{\,1}}$$

$$= \frac{3\times 3}{2\times 1}$$

$$= \frac{9}{2}$$

$$= 4\tfrac{1}{2}$$

Division

$$8\tfrac{1}{3} \div 1\tfrac{3}{7}$$

$$= \frac{25}{3} \div \frac{10}{7}$$

$$= \frac{\cancel{25}^{\,5}}{3} \times \frac{7}{\cancel{10}_{\,2}}$$

$$= \frac{5\times 7}{3\times 2}$$

$$= \frac{35}{6} = 5\tfrac{5}{6}$$

Exercise

1) $3\tfrac{2}{3} + 1\tfrac{3}{4}$

$$= 4\,\frac{8+9}{12}$$

2) $6\tfrac{1}{2} - 1\tfrac{5}{7}$

14t

$$= 4\,\frac{7-10}{14}$$

$= 4\frac{17}{12}$

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

$= 4\frac{11}{14}$

3) $3\frac{1}{3} \times 1\frac{2}{5}$

$= \frac{\cancel{10}^{2}}{3} \times \frac{7}{\cancel{5}_{1}}$

$= \frac{2 \times 7}{3 \times 1}$

$= \frac{14}{3}$

$= 4\frac{2}{3}$

4) $6\frac{1}{4} \div 2\frac{1}{2}$

$= \frac{25}{4} \div \frac{5}{2}$

$= \frac{\cancel{25}^{5}}{\cancel{4}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{5}_{1}}$

$= \frac{5 \times 1}{2 \times 1}$

$= \frac{5}{2} = 2\frac{1}{2}$

Expanding 3 Pairs of Brackets

Ex1 $(x+2)(x+5)(x+1)$

$= [x^2 + 2x + 5x + 10](x+1)$

$= [x^2 + 7x + 10](x+1)$

$$\begin{array}{rl} = & x^3 + 7x^2 + 10x \\ & \quad + x^2 + 7x + 10 \\ \hline = & x^3 + 8x^2 + 17x + 10 \end{array}$$

Ex 2 $(2x-3)(x+4)(3x-1)$

$= [2x^2 - 3x + 8x - 12](3x-1)$

$= [2x^2 + 5x - 12](3x-1)$

$$\begin{aligned} = \; & 6x^3 + 15x^2 - 36x \\ & \quad - 2x^2 - 5x + 12 \\ \hline = \; & 6x^3 + 13x^2 - 41x + 12 \end{aligned}$$

Exercise

1) $(x+1)(x+2)(x+3)$

$= [x^2 + x + 2x + 2](x+3)$

$= [x^2 + 3x + 2](x+3)$

$$\begin{aligned} = \; & x^3 + 3x^2 + 2x \\ & \quad + 3x^2 + 9x + 6 \\ \hline = \; & x^3 + 6x^2 + 11x + 6 \end{aligned}$$

2) $(2x+1)(3x-2)(x-5)$

$= [6x^2 + 3x - 4x - 2](x-5)$

$$= [6x^2 - x - 2](x - 5)$$

$$= 6x^3 - x^2 - 2x$$

$$\quad\quad - 30x^2 + 5x + 10$$

$$= 6x^3 - 31x^2 + 3x + 10$$

Number of Ways - Counting

Ex 1 How many different 3 figure numbers

a) can be made using 7, 6, 5, 4, 3, 2 without repetition?

6	5	4

$6 \times 5 \times 4 = 120$

b) With repetition allowed

$6 \times 6 \times 6 = 216$

Ex 2 10 girls 8 boys

How many Head boy / Head Girl teams could be selected.

$10 \times 8 = 80$

How many 2 person leadership teams

if both can be same sender.

$$\frac{18 \times 17}{2} = 153$$

Divided by 2 because Alan, Bill is same team as Bill, Alan

Similarly, If 5 people in room each shake each other hand, how many handshakes take place

$$\frac{5 \times 4}{2} = 10$$