SOLUTIONS FOR S.4 MATH WORKSHEET THREE

1. Simplify the following expressions

(a) $\frac{m+1}{2}+\frac{m-3}{2}$

$=\frac{m+1+m-3}{2}$

$=\frac{m+m+1-3}{2}$

$=\frac{2m-2}{2}$

$=\frac{2(m-1)}{2}$

$=\boldsymbol{m-1}$

(b) $\frac{2w+1}{2}-\frac{6w-2}{4}$

$=\frac{2(2w+1)-1(6w-2)}{4}$

$=\frac{4w+2-6w+2}{4}$

$=\frac{4w-6w+2+2}{4}$

$=\frac{\boldsymbol{-2w+4}}{\boldsymbol{4}}$

$=\frac{\boldsymbol{2}(\boldsymbol{-w+2})}{\boldsymbol{4}}$

$=\frac{\boldsymbol{-w+2}}{\boldsymbol{2}}\ \boldsymbol{or}\ \frac{\boldsymbol{2-w}}{\boldsymbol{2}}$

(c) $\frac{y+6}{5}+\frac{2y-5}{15}$

$=\frac{3(y+6)+1(2y-5)}{15}$

$=\frac{3y+18+2y-5}{15}$

$=\frac{3y+2y+18-5}{15}$

$=\frac{\boldsymbol{5y+13}}{\boldsymbol{15}}$

(d) $\frac{5-2n}{4}+\frac{3p-1}{2}$

$=\frac{5-2n+2(3p-1)}{4}$

$=\frac{5-2n+6p-2}{4}$

$=\frac{6p-2n+5-2}{4}$

$=\frac{\boldsymbol{6p-2n+3}}{\boldsymbol{4}}$

(e) $\frac{3x+4}{11}+\frac{2x}{33}$

$=\frac{3(3x+4)+1\times 2x}{33}$

$=\frac{9x+12+2x}{33}$

$=\frac{9x+2x+12}{33}$

$=\frac{\boldsymbol{11x+12}}{\boldsymbol{33}}$

(f) $\frac{v}{2}-\frac{v+1}{4}$

$=\frac{2\times v-1(v+1)}{4}$

$=\frac{2v-v-1}{4}$

$=\frac{\boldsymbol{v-1}}{\boldsymbol{4}}$

(g) $x+2a-\frac{3x-1}{4}-\frac{2a}{5}$

$=\frac{x}{1}+\frac{2a}{1}-\frac{3x-1}{4}-\frac{2a}{5}$

$=\frac{20\times x+20\times 2a-5(3x-1)-4\times 2a}{20}$

$=\frac{20x+40a-15x+5-8a}{20}$

$=\frac{40a-8a+20x-15x}{20}$

$=\frac{\boldsymbol{32a+5x+5}}{\boldsymbol{20}}$

(h) $\frac{x-1}{2}-\frac{1}{3}+\frac{x}{3}$

$=\frac{3(x-1)-2\times 1+2\times x}{6}$

$=\frac{3x-3-2+2x}{6}$

$=\frac{3x+2x-3-2}{6}$

$=\frac{\boldsymbol{5x-5}}{6}$

$=\frac{\boldsymbol{5}(x-1)}{6}\ or\ \frac{\boldsymbol{5}}{\boldsymbol{6}}(\boldsymbol{x-1})$

(i) $\frac{4a}{7}+\frac{3a+5}{2}-\frac{3(a+2)}{3}$

$=\frac{4a}{7}+\frac{3a+5}{2}-\frac{(a+2)}{1}$

$=\frac{2\times 4a+7(3a+5)-14(a+2)}{14}$

$\frac{8a+21a+35-14a-28}{14}$

$\frac{29a-14a+35-28}{14}$

(j) $\frac{3p}{12}-\left(\frac{p}{2}-\frac{p}{4}+\frac{5p}{6}\right)$

$=\frac{3p}{12}-\left(\frac{6\times p-3\times p+2\times 5p}{12}\right)$

$=\frac{3p}{12}-\left(\frac{6p-3p+10p}{12}\right)$

$=\frac{3p}{12}-\left(\frac{3p+10p}{12}\right)$

$=\frac{3p}{12}-\left(\frac{13p}{12}\right)$

$= \frac{15a+7}{14}$	$= \frac{3p-13p}{12}$ $= \frac{-10p}{12}$ $= -\frac{5p}{6}$

2. Solve the following equations

(a) $\frac{5x+2}{3} - \frac{7x+2}{5} = 2$ $15 \times \frac{5x+2}{3} - \frac{7x+2}{5} \times 15 = 2 \times 15$ $5(5x+2) - 3(7x+2) = 30$ $25x + 10 - 21x - 6 = 30$ $25x - 21x + 10 - 6 = 30$ $4x + 4 = 30$ $4x = 30 - 4$ $4x = 26$ $\frac{4x}{4} = \frac{26}{4}$ $x = \frac{13}{2}$ $x = 6\frac{1}{2}$	(b) $\frac{3}{4}(2a+1) = \frac{5}{6}(a+5)$ $12 \times \frac{3}{4}(2a+1) = \frac{5}{6}(a+5) \times 12$ $3 \times 3(2a+1) = 2 \times 5(a+5)$ $9(2a+1) = 10(a+5)$ $18a + 9 = 10a + 50$ $18a - 10 = 50 - 9$ $8a = 50 - 9$ $8a = 41$ $\frac{8a}{8} = \frac{41}{8}$ $a = 5\frac{1}{8}$
(c) $\frac{n-1}{2} - \frac{n-3}{4} = \frac{1}{2}$ $4 \times \frac{n-1}{2} - \frac{n-3}{4} \times 4 = \frac{1}{2} \times 4$ $2(n-1) - 1(n-3) = 1 \times 2$ $2n - 2 - n + 3 = 2$ $2n - n - 2 + 3 = 2$ $n + 1 = 2$ $n = 2 - 1$ $n = 1$	(d) $\frac{2}{2} - \frac{x+1}{4} = \frac{x}{3} + 2$ $12 \times \frac{2}{2} - \frac{x+1}{4} \times 12 = \frac{x}{3} \times 12 + 2 \times 12$ $6 \times 2 - 3(x+1) = x \times 4 + 24$ $12 - 3x - 3 = 4x + 24$ $12 - 3 - 3x = 4x + 24$ $9 - 3x = 4x + 24$ $-3x - 4x = 24 - 9$ $-7x = 15$ $\frac{-7x}{-7} = \frac{15}{-7}$ $x = -\frac{15}{7}$ $x = -2\frac{1}{7}$
(e) $\frac{n+1}{2} - \frac{n-3}{4} = \frac{n+2}{3}$ $12 \times \frac{n+1}{2} - \frac{n-3}{4} \times 12 = \frac{n+2}{3} \times 12$ $6(n+1) - 3(n-3) = 4(n+2)$ $6n + 6 - 3n + 9 = 4n + 8$ $6n - 3n + 6 + 9 = 4n + 8$ $3n + 15 = 4n + 8$ $3n - 4n = 8 - 15$ $-n = -7$ $\frac{-n}{-1} = \frac{-7}{-1}$ $n = 7$	(f) $\frac{4p-1}{3} - \frac{3p-1}{2} = \frac{5-2p}{4}$ $12 \times \frac{4p-1}{3} - \frac{3p-1}{2} \times 12 = \frac{5-2p}{4} \times 12$ $4(4p-1) - 6(3p-1) = 3(5-2p)$ $16p - 4 - 18p + 6 = 15 - 6p$ $16p - 18p - 4 + 6 = 15 - 6p$ $-2p + 2 = 15 - 6p$ $-2p + 6p = 15 - 2$ $4p = 13$ $\frac{4p}{4} = \frac{13}{4}$ $p = \frac{13}{4}$ $p = 3\frac{1}{4}$

(g) $\frac{1}{5}(w+6)-\frac{1}{15}(2w-5)=\frac{1}{3}(1-w)$

$15\times\frac{1}{5}(w+6)-\frac{1}{15}(2w-5)\times 15=\frac{1}{3}(1-w)\times 15$

$3(w+6)-(2w-5)=5(1-w)$

$3w+18-2w+5=5-5w$

$3w-2w+18+5=5-5w$

$w+23=5-5w$

$w+5w=5-23$

$6w=-18$

$\frac{6w}{6}=\frac{-18}{6}$

$w=-3$

(h) $\frac{1}{2}-\frac{x}{6}=-\frac{5}{2}$

$6\times\frac{1}{2}-\frac{x}{6}\times 6=-\frac{5}{2}\times 6$

$3\times 1-x\times 1=-5\times 3$

$3-x=-15$

$-x=-15-3$

$-x=-18$

$\frac{-x}{-1}=\frac{-18}{-1}$

$x=18$

(i) $\frac{4p-1}{3}-\frac{3p-1}{2}=1$

$6\times\frac{4p-1}{3}-\frac{3p-1}{2}\times 6=1\times 6$

$2(4p-1)-3(3p-1)=6$

$8p-2-9p+3=6$

$8p-9p-2+3=6$

$-p+1=6$

$-p=6-1$

$-p=5$

$\frac{-p}{-1}=\frac{5}{-1}$

$p=-5$

(j) $\frac{x+1}{3}+\frac{x-4}{2}=5$

$6\times\frac{x+1}{3}+\frac{x-4}{2}\times 6=5\times 6$

$2(x+1)+3(x-4)=30$

$2x+2+3x-12=30$

$2x+3x+2-12=30$

$5x-10=30$

$5x=30+10$

$5x=40$

$\frac{5x}{5}=\frac{40}{5}$

$x=8$

END.