Chapter 7: Simplification (Order of Operations)

Exercise 7A

1. $28 - 3 \times 5 + 4 = 28 - 15 + 4 = 32 - 15 = 17$
2. $42 - 18 \div 2 \times 3 = 42 - 9 \times 3 = 42 - 27 = 15$
3. $15 - 3 \times 4 \div 2 - 2 = 15 - 3 \times 2 - 2 = 15 - 6 - 2 = 9 - 2 = 7$
4. $36 \div 6 + 3 \times 2 = 6 + 6 = 12$
5. $27 + 8 \div 4 = 27 + 2 = 29$
6. $8 - 0 \div 5 = 8 - 0 = 8$
7. $8 \times 8 - 6 \times 6 = 64 - 36 = 28$
8. $5 \div 5 + 6 \times 6 = 1 + 36 = 37$
9. $7 \times 4 - 12 \div 6 - 8 = 28 - 2 - 8 = 26 - 8 = 18$
10. $25 \div 5 - 16 \div 8 = 5 - 2 = 3$
11. $8 - 30 \div 6 + 7 = 8 - 5 + 7 = 3 + 7 = 10$
12. $6 \times 5 - 60 \div 15 = 30 - 4 = 26$
13. $\frac{1}{3} + \frac{4}{5} \times \frac{7}{5} \div 1\frac{17}{25} = \frac{1}{3} + \frac{\cancel{28}^{2}}{\cancel{25}} \times \frac{\cancel{25}}{\cancel{42}_{3}} = \frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$

14. $\frac{3}{4}+\frac{4}{13}\div\frac{3}{52}-6=\frac{3}{4}+\frac{\cancel{4}}{\cancel{13}}\times\frac{\cancel{52}^{4}}{3}-6=\frac{3}{4}+\frac{16}{3}-6=\frac{3\times3+16\times4-6\times12}{12}$

$=\frac{9+64-72}{12}=\frac{73-72}{12}=\frac{1}{12}$

15. $\frac{6+9\times8}{5-8\div4}=\frac{6+72}{5-2}=\frac{78}{3}=26$

Exercise 7B

1. $(3+4)\times5=7\times5=35$
2. $(18-3)\div5=15\div5=3$
3. $9\div(6-3)=9\div3=3$
4. $(12\div4)+3=3+3=6$
5. $(21\div3)\div7=7\div7=1$
6. $[7+(18\div9)]+3=[7+2]+3=9+3=12$
7. $50-[(25\div5)\times7]=50-[5\times7]=50-35=15$
8. $16\div[2+(42\div7)]=16\div[2+6]=16\div8=2$
9. $[(60\div3)\times5]\div(27-2)=[20\times5]\div25=100\div25=4$
10. $(5+1)\div2\times4+7=6\div2\times4+7=3\times4+7=12+7=19$
11. $[3+(4\times5)\div2-6]=[3+20\div2-6]=[3+10-6]=7$
12. $450\div(18\times5)-10\div2=450\div90-5=5-5=0$
13. $\frac{1}{2}\text{ of }\left(\frac{1}{2}-\frac{1}{2}\right)\div\frac{1}{2}=\frac{1}{2}\times0\div\frac{1}{2}=0\div\frac{1}{2}=0$
14. $\left(\frac{1}{2}+\frac{1}{3}\right)\div1\frac{5}{6}\times11-3\frac{1}{2}=\left(\frac{5}{6}\right)\div\frac{11}{6}\times11-\frac{7}{2}=\frac{5}{\cancel{6}}\times\frac{\cancel{6}}{\cancel{11}}\times\cancel{11}-\frac{7}{2}=5-\frac{7}{2}=\frac{10-7}{2}=\frac{3}{2}=1\frac{1}{2}$
15. $\frac{4}{5}\text{ of }\left(\frac{4}{9}+\frac{2}{3}\right)\div2\frac{2}{3}=\frac{4}{5}\text{ of }\left(\frac{10}{9}\right)\div\frac{8}{3}=\frac{\cancel{4}}{\cancel{5}}\times\frac{\cancel{10}^{\cancel{5}}}{\cancel{9}_{3}}\times\frac{\cancel{3}}{\cancel{8}_{\cancel{2}}^{1}}=\frac{1}{3}$
16. $\left(\frac{3}{4}+\frac{1}{2}\right)\div2\frac{1}{2}-\left(\frac{\cancel{2}}{3}\times\frac{7}{\cancel{8}_{4}}\right)\div1\frac{1}{4}=\frac{5}{4}\div\frac{5}{2}-\left(\frac{7}{12}\right)\div\frac{5}{4}=\frac{\cancel{5}^{1}}{\cancel{4}_{2}}\times\frac{\cancel{2}}{\cancel{5}}-\frac{7}{\cancel{12}_{3}}\times\frac{\cancel{4}}{5}=\frac{1}{2}-\frac{7}{15}$

$=\frac{15-14}{30}=\frac{1}{30}$

17. $4\frac{1}{2}+4\frac{2}{3}\div\left(5\frac{1}{2}+3\frac{1}{4}\right)=\frac{9}{2}+\frac{14}{3}\div\left(\frac{11}{2}+\frac{13}{4}\right)=\frac{9}{2}+\frac{14}{3}\div\left(\frac{35}{4}\right)=\frac{9}{2}+\frac{\cancel{14}^{2}}{3}\times\frac{4}{\cancel{35}_{5}}=\frac{9}{2}+\frac{8}{15}$

$=\frac{135+16}{30}=\frac{151}{30}=5\frac{1}{30}$

18. $\frac{4}{9}\text{ of }1\frac{1}{13}+2\frac{1}{4}\div\left(\frac{1}{4}-\frac{1}{52}\right)=\frac{4}{9}\text{ of }\frac{14}{13}+\frac{9}{4}\div\left(\frac{13-1}{52}\right)=\frac{4}{9}\times\frac{14}{13}+\frac{\cancel{9}^{3}}{4}\times\frac{\cancel{52}^{13}}{\cancel{12}_{\cancel{4}}}=\frac{56}{117}+\frac{39}{4}$

$=\frac{56\times4+39\times117}{468}=\frac{224+4563}{468}=\frac{4787}{468}=10\frac{107}{468}$

Chapter Test

1. $[2+(12\times3\div9)-6]\div4=\left[2+\left(12\times\frac{1}{3}\right)-6\right]\div4=[2+4-6]\div4=[6-6]\times\frac{1}{4}=0\times\frac{1}{4}=0$

2. $\frac{3}{4}\times\frac{7}{5}\text{ of }\frac{17}{5}-\frac{1}{3}=\frac{3}{4}\times\frac{7}{5}\times\frac{17}{5}-\frac{1}{3}=\frac{357}{100}-\frac{1}{3}=\frac{357\times3-100}{300}=\frac{1071-100}{300}=\frac{971}{300}=3\frac{71}{300}$

3. $5\frac{1}{7}-\left\{3\frac{1}{10}\div\left(2\frac{4}{5}-\frac{7}{10}\right)\right\}=\frac{36}{7}-\left\{\frac{31}{10}\div\left(\frac{14}{5}-\frac{7}{10}\right)\right\}=\frac{36}{7}-\left\{\frac{31}{10}\div\left(\frac{28-7}{10}\right)\right\}=\frac{36}{7}-\left\{\frac{31}{10}\div\frac{21}{10}\right\}$

$=\frac{36}{7}-\frac{31}{\cancel{10}}\times\frac{\cancel{10}}{21}=\frac{36\times3-31}{21}=\frac{108-31}{21}=\frac{\cancel{77}^{11}}{\cancel{21}_{3}}=\frac{11}{3}=3\frac{2}{3}$

4. (b) $(10\times12-14\div2+15=120-7+15=135-7=128)$

5. (c) $\left[2\div(3+5)\times6=2\div8\times6=\frac{\cancel{2}}{\cancel{8}_{\cancel{4}_{2}}}\times\cancel{6}^{3}=\frac{3}{2}=1\frac{1}{2}\right]$

6. (b) $\{6-[6-\{6-(6\div3)\}]=6-[6-\{6-2\}]=6-[6-4]=6-2=4\}$

7. (b) $\left\{1+1\div\left(1+\frac{1}{3}\right)=1+1\div\frac{4}{3}=1+\frac{3}{4}=\frac{7}{4}\right\}$

8. (a) $\left(\frac{2}{3}\times3\div\left(\frac{5}{6}\div\frac{2}{3}\text{ of }1\frac{1}{4}\right)=\frac{2}{3}\times3\div\left(\frac{5}{6}\div\frac{\cancel{2}}{3}\times\frac{5}{\cancel{4}_{2}}\right)=\frac{2}{3}\times3\div\left(\frac{\cancel{5}}{\cancel{6}}\times\frac{\cancel{6}}{\cancel{5}}\right)=\frac{2}{\cancel{3}}\times\frac{\cancel{3}}{1}=2\right)$