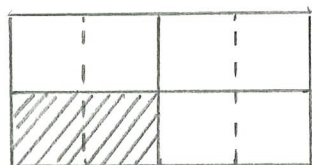


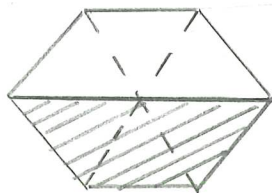
Ex. 6.1A

6. (a)



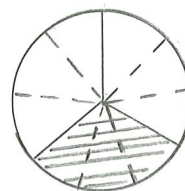
$$\frac{1}{4} = \frac{2}{8}$$

(c)



$$\frac{1}{2} = \frac{3}{6}$$

(b)



$$\frac{1}{3} = \frac{3}{9}$$

9. (a)

$$\frac{2}{9} = \frac{4}{18} = \frac{6}{27} = \frac{8}{36}$$

(b)

$$\frac{-2}{5} = \frac{-4}{10} = \frac{-6}{15} = \frac{-8}{20}$$

(c)

$$\frac{0}{3} = \frac{0}{6} = \frac{0}{9} = \frac{0}{12}$$

(d)

$$\frac{a}{2} = \frac{2a}{4} = \frac{3a}{6} = \frac{4a}{8}$$

10. (a)

$$\frac{156}{93} = \frac{52 \times 3}{31 \times 3} = \frac{52}{31}$$

(b)

$$\frac{27}{45} = \frac{3 \times 9}{5 \times 9} = \frac{3}{5}$$

(c)

$$\frac{-65}{91} = \frac{-5 \times 13}{7 \times 13} = \frac{-5}{7}$$

11. (a) $\frac{0}{0}$ is undefined.

(b) $\frac{5}{0}$ is undefined.

(c) $\frac{0}{5}$ is zero.

(d) $\frac{2+a}{a}$ cannot be simplified.

(e) $\frac{15+x}{3x}$ cannot be simplified.

12. (a)

$$\frac{a^2 - b^2}{3a + 3b} = \frac{(a-b)(a+b)}{3(a+b)} = \frac{a-b}{3}$$

(b)

$$\frac{14x^2y}{63xy^2} = \frac{7xy \cdot 2x}{7xy \cdot 9y} = \frac{2x}{9y}$$

14. (a)

$$16 = 2^4 \text{ and } 18 = 2^1 3^2 \text{ so LCM} = 2^4 3^2 = 144$$

$$\frac{10}{16} = \frac{10 \times 9}{16 \times 9} = \frac{90}{144} \text{ and } \frac{12}{18} = \frac{12 \times 8}{18 \times 8} = \frac{96}{144}, \text{ therefore } \frac{10}{16} \neq \frac{12}{18}.$$

(b)

$$86 = 2^1 43^1 \text{ and } 215 = 5^1 43^1 \text{ so LCM} = 2^1 5^1 43^1 = 430$$

$$\frac{-21}{86} = \frac{-21 \times 5}{86 \times 5} = \frac{-105}{430} \text{ and } \frac{-51}{215} = \frac{-51 \times 2}{215 \times 2} = \frac{-102}{430},$$

$$\text{therefore } \frac{-21}{86} \neq \frac{-51}{215}.$$

23. (a)

$$\frac{11}{13}, \frac{11}{16}, \frac{11}{22}$$

(b)

$$\frac{-1}{5} = \frac{-36}{180}$$

$$\frac{-19}{36} = \frac{-95}{180}$$

$$\frac{-17}{30} = \frac{-102}{180}$$

In decreasing order:

$$\frac{-1}{5}, \frac{-19}{36}, \frac{-17}{30}$$

Ex. 6.2A

1. (a) $\frac{1}{2} + \frac{2}{3} = \frac{3}{6} + \frac{4}{6} = \frac{7}{6}$ or $1\frac{1}{6}$
(b) $\frac{4}{12} - \frac{2}{3} = \frac{1}{3} - \frac{2}{3} = \frac{1-2}{3} = \frac{-1}{3}$
(c) $\frac{5}{x} + \frac{-3}{y} = \frac{5y}{xy} + \frac{-3x}{xy} = \frac{5y-3x}{xy}$
(d) $\frac{-3}{2x^2y} + \frac{5}{2xy^2} + \frac{7}{x^2} = \frac{-3y}{2x^2y^2} + \frac{5x}{2x^2y^2} + \frac{14y^2}{2x^2y^2} = \frac{-3y+5x+14y^2}{2x^2y^2}$
(e) $\frac{5}{6} + 2\frac{1}{8} = \frac{5}{6} + \frac{17}{8} = \frac{20}{24} + \frac{51}{24} = \frac{71}{24}$ or $2\frac{23}{24}$
(f) $-4\frac{1}{2} - 3\frac{1}{6} = \frac{-9}{2} - \frac{19}{6} = \frac{-27}{6} + \frac{-19}{6} = \frac{-46}{6} = \frac{-23}{3}$ or $-7\frac{2}{3}$
12. $\frac{2}{5} + \frac{1}{4} + \frac{1}{10} = \frac{8}{20} + \frac{5}{20} + \frac{2}{20} = \frac{15}{20} = \frac{3}{4}$ and $1 - \frac{3}{4} = \frac{1}{4}$
 $\frac{1}{4}$ of the class is seniors.
14. $1\frac{7}{8} + 2\frac{3}{8} + 1\frac{2}{3} = \frac{15}{8} + \frac{19}{8} + \frac{5}{3} = \frac{45}{24} + \frac{57}{24} + \frac{40}{24} = \frac{142}{24} = \frac{71}{12}$
number of yards left $= 8\frac{3}{4} - \frac{71}{12} = \frac{35}{4} - \frac{71}{12} = \frac{105}{12} - \frac{71}{12} = \frac{34}{12} = \frac{17}{6} = 2\frac{5}{6}$ yards
15. (a) $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$ which is still a rational number
(b) $\frac{1}{5} + \frac{2}{5} = \frac{3}{5} = \frac{2}{5} + \frac{1}{5}$
(c) $\frac{1}{5} + (\frac{2}{5} + \frac{3}{5}) = \frac{1}{5} + \frac{5}{5} = \frac{6}{5}$ and $(\frac{1}{5} + \frac{2}{5}) + \frac{3}{5} = \frac{3}{5} + \frac{3}{5} = \frac{6}{5}$
17. (a) $x + 2\frac{1}{2} = 3\frac{1}{3}$
 $x = 3\frac{1}{3} - 2\frac{1}{2}$
 $x = \frac{10}{3} - \frac{5}{2}$
 $x = \frac{20}{6} - \frac{15}{6} = \frac{5}{6}$
(b) $x - 2\frac{2}{3} = \frac{5}{6}$
 $x = \frac{5}{6} + 2\frac{2}{3}$
 $x = \frac{5}{6} + \frac{8}{3}$
 $x = \frac{5}{6} + \frac{16}{6} = \frac{21}{6} = \frac{7}{2} = 3\frac{1}{2}$