

Unit 4 Answers

Exercise 4.1

1 a 4

b 3

c 7

d 8

2 a $\frac{1}{2}$

b $\frac{1}{3}$

c $\frac{3}{8}$

d $\frac{5}{9}$

3 $\frac{1}{4} = \frac{2}{8}$ $\frac{4}{5} = \frac{8}{10}$ $\frac{1}{2} = \frac{3}{6}$ $\frac{15}{20} = \frac{3}{4}$

4 a $\frac{2}{7} < \frac{3}{8}$

b $\frac{5}{6} > \frac{3}{4}$

c $\frac{1}{3} < \frac{3}{7}$

d $\frac{3}{5} > \frac{1}{2}$

5 $\frac{2}{5}, \frac{1}{2}, \frac{4}{7}, \frac{5}{8}$

6 $\frac{3}{4}$

7 $\frac{4}{5}$

8 a $\frac{3}{5}$

b $\frac{3}{4}$

c $\frac{2}{3}$

d $\frac{1}{2}$

e $\frac{1}{3}$

f $\frac{2}{5}$

9 $\frac{1}{2}$

10 $\frac{1}{3}$

11a $\frac{3}{4}$

b $\frac{1}{5}$

c $\frac{1}{20}$

12 $\frac{2}{3}$

13a £20

b 5 kg

c 100 m/

d 15 cm

14a £60

b 21 m

c 100 mm

d 12 kg

15 $\frac{5}{6}$ of 24 m

16 42 cm²

Unit 4 Answers

Exercise 4.2

1 a $\frac{1}{2}$

b $\frac{2}{3}$

c $\frac{3}{5}$

d $\frac{6}{7}$

2 a 6

b 10

c 24

3 a 2 remainder 2

b 2 remainder 2

c 4 remainder 2

d 15 remainder 1

4 a 4

b 5

c 3

d 10

5 $\frac{11}{5}$

6 a $1\frac{3}{4}$

b $2\frac{2}{5}$

c $4\frac{3}{7}$

d $7\frac{2}{3}$

7 a $\frac{2}{3}$

b $\frac{6}{7}$

c $\frac{5}{11}$

d $\frac{2}{5}$

8 a $\frac{1}{3}$

b $\frac{1}{6}$

9 Possible answers: $\frac{1}{10} + \frac{3}{10}$, $\frac{2}{15} + \frac{4}{15}$, $\frac{5}{20} + \frac{3}{20}$ etc.

10a $\frac{7}{10}$

b $\frac{1}{6}$

c $\frac{7}{9}$

d $\frac{8}{15}$

11 $\frac{11}{16}$ of an inch

12a $\frac{5}{6}$

b $\frac{21}{40}$

13a $1\frac{1}{2}$

b $1\frac{1}{90}$

c $1\frac{7}{20}$

d $1\frac{7}{18}$

14a Any one of: $\frac{7}{10} + \frac{27}{30} = 1\frac{3}{5}$ $\frac{7}{10} + \frac{5}{12} = 1\frac{7}{60}$ $\frac{7}{10} + \frac{11}{15} = 1\frac{13}{30}$
 $\frac{27}{30} + \frac{5}{12} = 1\frac{19}{60}$ $\frac{27}{30} + \frac{11}{15} = 1\frac{19}{30}$ $\frac{5}{12} + \frac{11}{15} = 1\frac{3}{20}$

b $\frac{27}{30} + \frac{11}{15} = 1\frac{19}{30}$

c Any one of: $\frac{27}{30} - \frac{7}{10} = \frac{1}{5}$ $\frac{27}{30} - \frac{5}{12} = \frac{29}{60}$ $\frac{27}{30} - \frac{11}{15} = \frac{1}{6}$
 $\frac{7}{10} - \frac{5}{12} = \frac{17}{60}$ $\frac{11}{15} - \frac{7}{10} = \frac{1}{30}$ $\frac{11}{15} - \frac{5}{12} = \frac{19}{60}$

d $\frac{27}{30} - \frac{5}{12} = \frac{29}{60}$

15a $1\frac{11}{12}$

b $\frac{31}{20}$

c $\frac{3}{4}$

d $\frac{3}{10}$

16a $\frac{2}{5}$

b 30, as the LCM of 15, 10 and 6 is 30, and a normal class size is around 30 students.

Unit 4 Answers

Exercise 4.3

1 a $\frac{2}{10}$

b $\frac{4}{10}$

c $\frac{6}{10}$

2 a 0.875

b 0.45

3 $\frac{5}{12}$

4

Fraction	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{3}{10}$	$\frac{2}{5}$	$\frac{1}{2}$	$\frac{3}{5}$	$\frac{7}{10}$	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{9}{10}$
Decimal	0.1	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.75	0.8	0.9
Percentage	10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%

5

Fraction	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{10}$	$1\frac{1}{5}$	$1\frac{7}{10}$	$1\frac{2}{5}$
Decimal	1.75	1.5	1.3	1.2	1.7	1.4
Percentage	175%	150%	130%	120%	170%	140%

6 a 2.5

b £455 000

7 a 0.8

b 0.15

c 0.75

d 1.875

e 0.4

8 a $\frac{13}{20}$

b 0.65

c 65%

9 a A $\frac{132}{150} = \frac{22}{25}$, B $\frac{182}{200} = \frac{91}{100}$, C $\frac{68}{80} = \frac{17}{20}$, D $\frac{320}{350} = \frac{32}{35}$, E $\frac{382}{420} = \frac{191}{210}$

b Yes because the success rates are all close to 0.9

A 0.88, B 0.91, C 0.85, D 0.91 (2 d.p.), E 0.91 (2 d.p.)

10 **Yes.** Fraction carrot cake = $\frac{17}{37} = 0.459... = 45.9...%$ which is approximately 45%

- 11a** 0.125
- b** 0.0625
- c** 0.03125
- 12a** 0.005
- b** 0.0025
- c** 0.02
- d** 0.04

Unit 4 Answers

Exercise 4.4

1 a £30

b 9 m

c 12 cm

d 20 kg

$$2 \quad \frac{4}{6} = \frac{2}{3}, \quad \frac{12}{15} = \frac{4}{5}, \quad \frac{16}{28} = \frac{4}{7}, \quad \frac{35}{50} = \frac{7}{10}$$

3 a 8

b 18

c 20

d 6

e 10

f 9

g 4

h 40

$$4 \text{ a } 7\frac{1}{5} \text{ kg}$$

$$\text{b } 9\frac{3}{4} \text{ m}$$

$$\text{c } 16\frac{2}{3} \text{ mm}$$

$$\text{d } 4\frac{2}{3} \text{ km}$$

$$5 \quad 26\frac{1}{4} \text{ miles}$$

$$6 \text{ a } 1 \div \frac{1}{2} = 1 \times 2 = 2$$

$$\text{b } 1 \div \frac{1}{3} = 1 \times 3 = 3$$

$$\text{c } 1 \div \frac{1}{4} = 1 \times 4 = 4$$

$$\text{d } 1 \div \frac{1}{5} = 1 \times 5 = 5$$

$$7 \text{ a } 4 \div \frac{1}{2} = 4 \times \frac{2}{1} = 8$$

$$\text{b } 8 \div \frac{2}{3} = 8 \times \frac{3}{2} = 12$$

$$\text{c } 6 \div \frac{3}{5} = 6 \times \frac{5}{3} = 10$$

d $15 \div \frac{5}{8} = 15 \times \frac{8}{5} = 24$

8 a 480

b 600

9 a $\frac{1}{6}$

b $\frac{1}{6}$

c $\frac{1}{5}$

d $\frac{4}{9}$

10 $\frac{1}{8}$

11a $\frac{3}{7}$

b $\frac{2}{7}$

c $\frac{3}{8}$

d $\frac{3}{4}$

12a $\frac{7}{18} \text{ m}^2$

b $\frac{2}{9} \text{ m}^2$

13a $\frac{4}{7}$

b $\frac{13}{15}$

c $\frac{2}{3}$

d $\frac{2}{3}$

Unit 4 Answers

Exercise 4.5

1 a $\frac{11}{15}$

b $\frac{1}{24}$

2 a $\frac{2}{5}$

b $\frac{3}{4}$

3 a $1\frac{2}{3}$

b $3\frac{1}{2}$

c $1\frac{4}{5}$

d $2\frac{2}{7}$

4 a $2\frac{1}{4}$ hours

b $5\frac{1}{3}$ hours

c $4\frac{1}{5}$ hours

d $7\frac{1}{6}$ hours

5 a 3.25

b 2.2

c 3.6

6 a $3\frac{7}{8}$

b $20\frac{11}{15}$

c $6\frac{3}{10}$

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

e $6\frac{1}{6}$

f $12\frac{9}{20}$

7 a $2\frac{1}{2}$

b $2\frac{1}{10}$

c $3\frac{5}{24}$

d $1\frac{5}{6}$

e $1\frac{5}{8}$

f $2\frac{11}{15}$

g $2\frac{15}{28}$

8 a 6 hours 20 minutes

b 4.05 pm

9 $4\frac{17}{18}$

10a $17\frac{1}{2}$

b $27\frac{1}{3}$

c $1\frac{1}{2}$

d $1\frac{3}{5}$

e $6\frac{1}{3}$

11 $2\frac{5}{6}\text{m}^2$

12a $1\frac{3}{8}$

b $2\frac{5}{6}$

c $5\frac{1}{4}$

d $8\frac{2}{3}$

e $3\frac{5}{7}$

13a 22

b 5 cm

Unit 4 Answers

4 Check up

Equivalence

1 $\frac{7}{10}$

2 a $\frac{1}{2}$

b $\frac{2}{3}$

3 $\frac{1}{3}$

4 a $\frac{5}{6}$

b $\frac{13}{18}$

c $\frac{1}{20}$

d $\frac{1}{15}$

5

Fraction	$\frac{1}{4}$	$\frac{2}{5}$	$\frac{1}{2}$	$\frac{7}{10}$	$1\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{5}$
Decimal	0.25	0.4	0.5	0.7	1.5	2.75	3.2
Percentage	25%	40%	50%	70%	150%	275%	320%

6 $\frac{2}{5}$

7 a 0.875

b 4.4

Multiplying and dividing with fractions

8 a £5

b 10 kg

9 15

10 $12\frac{1}{2}$ tonnes

11a 24

b 42

12 $\frac{1}{10}$

13 $\frac{3}{5}$

14a 6

b $\frac{5}{6}$

Working with mixed numbers

15a $10\frac{5}{12}$

b $1\frac{19}{30}$

16a $4\frac{3}{4}$ hours

b $3\frac{1}{6}$ hours

17 $29\frac{1}{4}$

18 $2\frac{5}{16}$

Unit 4 Answers

4 Strengthen

Equivalence

1 a $\frac{1}{2}$

b $\frac{3}{4}$

c $\frac{5}{6}$

d $\frac{3}{8}$

e $\frac{8}{11}$

2 $\frac{3}{8}$

3 a $\frac{1}{3}$

b $\frac{2}{3}$

4 a 64

b i $\frac{1}{8}$

ii $\frac{3}{8}$

5 a $\frac{3}{4} = 0.75 = 75\%$

b $\frac{2}{5} = 0.4 = 40\%$, $\frac{3}{5} = 0.6 = 60\%$, $\frac{4}{5} = 0.8 = 80\%$

c $\frac{2}{10} = 0.2 = 20\%$, $\frac{3}{10} = 0.3 = 30\%$, $\frac{4}{10} = 0.4 = 40\%$, $\frac{5}{10} = 0.5 = 50\%$, $\frac{6}{10} = 0.6 = 60\%$,

$\frac{7}{10} = 0.7 = 70\%$, $\frac{8}{10} = 0.8 = 80\%$, $\frac{9}{10} = 0.9 = 90\%$

6

Fraction	$1\frac{1}{4}$	$1\frac{2}{5}$	$2\frac{1}{2}$	$2\frac{3}{5}$	$3\frac{1}{10}$
Decimal	1.25	1.4	2.5	2.6	3.1
Percentage	125%	140%	250%	260%	310%

7 a 0.125

- b** 1.375
- c** 2.25
- d** 0.35

Multiplying and dividing with fractions

- 1 a** £12
- b** 21 kg
 - c** 15 km

- 2 a** 26
- b** 12
 - c** 20

3 a $8\frac{2}{3}$ kg

b $13\frac{3}{5}$ km

c $5\frac{3}{7}$ m

d $17\frac{1}{2}$ km

- 4 a** 4
- b** 4

Dividing by $\frac{3}{4}$ is the same as multiplying by $\frac{4}{3}$

- 5 a** 9
- b** 9

Dividing by $\frac{2}{3}$ is the same as multiplying by $\frac{3}{2}$

6 10

7 a $\frac{1}{3}$

b $\frac{1}{8}$

c $\frac{2}{15}$

d $\frac{3}{20}$

8 a $\frac{1}{14}$

b $\frac{6}{35}$

c $\frac{3}{10}$

d $\frac{1}{3}$

9 a $\frac{5}{6}$

b $\frac{2}{5}$

c $\frac{7}{8}$

Working with mixed numbers

1 a $\frac{9}{4}$

b $\frac{7}{2}$

c $\frac{17}{3}$

d $\frac{23}{10}$

e $\frac{17}{6}$

f $\frac{53}{5}$

2 a 5

b 3

c $3\frac{1}{4}$

d $3\frac{1}{3}$

e $3\frac{1}{3}$

f $2\frac{2}{7}$

3 a $9\frac{1}{6}$

b $9\frac{11}{20}$

c $9\frac{8}{9}$

d $3\frac{7}{12}$

4 a $\frac{14}{3} - \frac{11}{9} = \frac{42}{9} - \frac{11}{9} = \frac{31}{9} = 3\frac{4}{9}$

b $\frac{4}{15}$

c $\frac{1}{2}$

d $1\frac{2}{3}$

5 a i 10 minutes = $\frac{10}{60}$ hour = $\frac{1}{6}$ hour

ii 12 minutes = $\frac{12}{60}$ hour = $\frac{1}{5}$ hour

iii 15 minutes = $\frac{15}{60}$ hour = $\frac{3}{4}$ hour

iv 25 minutes = $\frac{25}{60}$ hour = $\frac{5}{12}$ hour

v 45 minutes = $\frac{45}{60}$ hour = $\frac{3}{4}$ hour

vi 40 minutes = $\frac{40}{60}$ hour = $\frac{2}{3}$ hour

b i $1\frac{1}{4}$ hours

ii $4\frac{11}{12}$ hours

6 a $4\frac{7}{12}$ hours

b $3\frac{1}{2}$ hours

c $1\frac{3}{4}$ hours

7 a $4\frac{13}{20}$

b $4\frac{22}{35}$

8 a $17\frac{3}{5}$

b $26\frac{2}{3}$

c 2

Enrichment

1 a $\frac{9}{10} + \frac{3}{5}$

b $\frac{3}{4} \times \frac{2}{3}$

c $\frac{9}{10} + \frac{3}{4} = 1\frac{13}{20}$

d $\frac{9}{10} - \frac{3}{5} = \frac{3}{10}$

Unit 4 Answers

4 Extend

1 $\frac{28}{49}$ is the odd one out because in all the other fractions, once they are simplified, the denominator is one more than the numerator

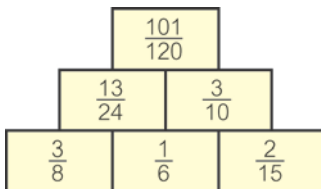
$$\frac{15}{20} = \frac{3}{4}, \frac{30}{36} = \frac{5}{6}, \frac{19}{38} = \frac{1}{2}, \frac{28}{49} = \frac{4}{7}, \frac{34}{51} = \frac{2}{3}, \frac{36}{45} = \frac{4}{5}$$

2 a 400 g

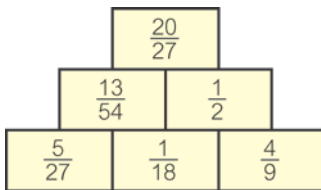
b $\frac{1}{4}$

3 $\frac{1}{3}$

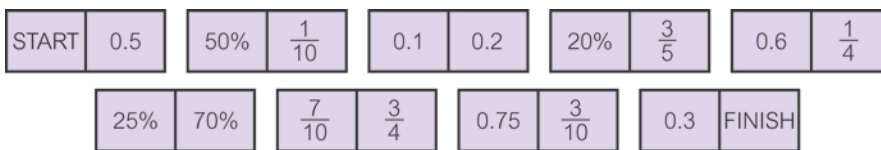
4 a



b



5



6 Nitrogen $1\frac{4}{5}$ tonnes, Phosphorus $3\frac{3}{5}$ tonnes

7 a Any one of:

$$\frac{5}{8} \times 315 = 196\frac{7}{8}$$

$$\frac{5}{8} \times 320 = 200$$

$$\frac{5}{8} \times 280 = 175$$

$$\frac{5}{8} \times 360 = 225$$

$$\frac{3}{5} \times 315 = 189$$

$$\frac{3}{5} \times 320 = 192$$

$$\frac{3}{5} \times 280 = 168$$

$$\frac{3}{5} \times 360 = 216$$

$$\frac{7}{9} \times 315 = 245$$

$$\frac{7}{9} \times 320 = 248\frac{8}{9}$$

$$\frac{7}{9} \times 280 = 217\frac{7}{9}$$

$$\frac{7}{9} \times 360 = 280$$

$$\frac{4}{7} \times 315 = 180$$

$$\frac{4}{7} \times 320 = 182\frac{6}{7}$$

$$\frac{4}{7} \times 280 = 160$$

$$\frac{4}{7} \times 360 = 205\frac{5}{7}$$

b i $\frac{7}{9} \times 360 = 280$

ii $\frac{4}{7} \times 280 = 160$

8 a Yes. As long as both numbers are positive, whether you're adding two integers, fractions or decimals, the answer will always be bigger than the individual numbers you are adding.

b No. The answer will be smaller than the first fraction, but may not be smaller than the second. For

example, $\frac{7}{9} - \frac{2}{9} = \frac{5}{9}$. $\frac{5}{9}$ is smaller than $\frac{7}{9}$, but is not smaller than $\frac{2}{9}$

9 a She divided 16 by 15 rather than 15 by 16

b 0.9375

10a 8

b $8\frac{17}{20}$

c $8\frac{1}{18}$

11a $12\frac{2}{3}$

b $11\frac{11}{20}$

12a $\frac{1}{14}$

b $\frac{5}{7}$

13a $\frac{39}{50}$

b $\frac{21}{100}$

c $\frac{1}{100}$

14 $12 \div \frac{2}{5} = 30 / 13, \div \frac{1}{2} = 26 / 15, \div \frac{5}{7} = 21 / 18, \div \frac{3}{4} = 24 / 30, \div \frac{5}{6} = 36$

15a $13\frac{1}{2}$

b $8\frac{3}{4}$

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

d $6\frac{3}{4}$

16a 90 miles

b $137\frac{1}{2}$ miles

c 200 miles

d $210\frac{4}{5}$ miles

17a i £5

ii £5

iii They are the same. $\frac{1}{6}$ Multiply them.

b i £24

ii £24

iii $\frac{3}{10}$ Multiply them.

c Yes

18

$9\frac{13}{30} - 6\frac{9}{10}$

$8\frac{2}{3} - 6\frac{2}{15}$

$4\frac{2}{5} - 2\frac{1}{4}$

$5\frac{17}{20} - 3\frac{7}{10}$

$7\frac{2}{3} - 5\frac{11}{12}$

$5\frac{19}{36} - 3\frac{7}{9}$

19 Students' own answers, e.g. $10\frac{3}{4} - 6\frac{11}{20} = 4\frac{1}{5}$

20 Yes. When you multiply a number by 1 you get the same number. When you multiply a number by a fraction less than 1, you will get a fraction of the number you started with, so the answer must be less than the number you started with.

21 $\frac{3}{10}$

22 No. $\frac{3}{8} \div 4 = \frac{3}{32}$

23 $\frac{2}{3}$

24 $23\frac{13}{30}$

Unit 4 Answers

4 Unit test

1 $\frac{2}{3}, \frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{3}{5}$

2 $\frac{3}{8}$

3 $\frac{6}{7}$ of 21kg, $\frac{1}{5}$ of 100 kg, $\frac{2}{3}$ of 36 kg

4 $2\frac{2}{5}$ litres

5 a $\frac{7}{8}$

b $\frac{6}{7}$

c $\frac{6}{7}$

d $\frac{1}{15}$

6 $6\frac{3}{4}$

7 $\frac{67}{10}$

8 a 12

b 20

9

Fraction	$\frac{1}{2}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{3}{10}$	$1\frac{1}{4}$	$4\frac{7}{10}$	$6\frac{2}{5}$
Decimal	0.5	0.8	0.75	0.3	1.25	4.7	6.4
Percentage	50%	80%	75%	30%	125%	470%	640%

103.4

11a $8\frac{3}{8}$

b $3\frac{1}{15}$

c $4\frac{5}{9}$

d $\frac{7}{22}$

12 $\frac{5}{13}$

13a 64

b 48

14a $3\frac{1}{2}$ hours

b $3\frac{1}{5}$ hours

15 5 hours 42 minutes

16 $\frac{4}{15}$

17 $7\frac{19}{30}$

18a $\frac{5}{14}$

b $\frac{1}{8}$

19 $13\frac{1}{3}$

20 $16\frac{4}{5}$