

GRADE 10 ESSENTIAL - FRACTIONS WORKBOOK ANSWERS
PRISM_BLUE_FRACTIONS
ANSWER KEY

This is the answer key for a fully satisfactory fractions workbook.

There should be few, if any, errors in this answer key.

The entire fraction workbook will typically occupy 320 minutes of your life!

The best 5 hours and 20 minutes you ever invested.

Lesson 1 - Multiplication

- 1a. $3/20$ b. $8/15$ c. $35/96$ d. $6/175$
 2a. $1/6$ b. $8/35$ c. $27/160$ d. $1/24$
 3a. $25/64$ b. $18/25$ c. $2/105$ d. $9/140$
 4a. $15/56$ b. $15/56$ c. $64/125$ d. $8/27$
 5a. $6/25$ b. $21/80$ c. $25/108$ d. $24/125$
 6a. $3/10$ b. $35/72$ c. $45/224$ d. $8/105$

Lesson 2 – GREATEST COMMON FACTOR

Need GCF so you can reduce fractions to simplest form

| | Factors | Common Factors | Greatest Common Factor (GCF) |
|----|---|----------------|------------------------------|
| 1. | 4: 1,2,4 6: 1,2,3,6 | 1,2 | 2 |
| 2. | 10: 1,2,5,10 12: 1,2,3,4,6,12 | 1,2 | 2 |
| 3. | 16: 1,2,4,8,16 24: 1,2,3,4,6,8,12,24 | 1,2,4,8 | 8 |
| 4. | 9: 1,3,9 16: 1,2,4,8,16 | 1 | 1 |
| 5. | 18: 1,2,3,6,9,18 20: 1,2,4,5,10,20 | 1,2 | 2 |
| 6. | 25: 1,5,25 24: 1,2,3,4,6,8,12,24 | 1 | 1 |
| 7. | 48: 1,2,3,4,6,8,12,16,24,48 36: 1,2,3,4,6,9,12,18,36 | 1,2,3,4,6,12 | 12 |

LESSON 3 – SIMPLEST FORM

(a decent calculator will simplify fractions for you too!)

- 1.a. $2/5$ b. $3/5$ c. $7/10$
 2.a. $4/9$ b. $20/21$ c. $1/2$
 3.a. $2\frac{3}{5}$ b. $6\frac{3}{5}$ c. $8\frac{2}{3}$
 4.a. $2/7$ b. $3\frac{2}{9}$ c. $7\frac{3}{4}$
 5.a. $5\frac{2}{5}$ b. $\frac{2}{7}$ c. $\frac{3}{5}$

LESSON 4 – SIMPLIFYING PRODUCTS

(Instead of simplifying at the final step, simplify earlier amongst the factors; generally easier).

- 1.a. $\frac{2}{5}$ b. $\frac{1}{4}$ c. $\frac{4}{15}$ d. $\frac{28}{45}$
 2.a. $\frac{5}{9}$ b. $\frac{28}{45}$ c. $\frac{35}{66}$ d. $\frac{3}{14}$
 3.a. $\frac{14}{33}$ b. $\frac{9}{13}$ c. $\frac{14}{33}$ d. $\frac{10}{27}$
 4.a. $\frac{1}{4}$ b. $\frac{3}{32}$ c. $\frac{4}{9}$ d. $\frac{8}{15}$
 5.a. $\frac{3}{10}$ b. $\frac{16}{21}$ c. $\frac{10}{21}$ d. $\frac{16}{25}$

LESSON 5 – SIMPLIFYING PRODUCTSSimplifying products of *three* fractions!

- 1.a. $\frac{1}{2}$ b. $\frac{1}{6}$ c. $\frac{3}{4}$ d. $\frac{1}{10}$
 2.a. $\frac{3}{4}$ b. $\frac{1}{6}$ c. $\frac{5}{6}$ d. $\frac{1}{2}$
 3.a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{2}{3}$ d. $\frac{1}{3}$
 4.a. $\frac{2}{5}$ b. $\frac{3}{5}$ c. $\frac{1}{4}$ d. $\frac{1}{4}$
 5.a. $\frac{1}{2}$ b. $\frac{1}{4}$ c. $\frac{1}{6}$ d. $\frac{1}{3}$

LESSON 6 RENAMING FRACTIONS AND MIXED NUMBERS

Changing between 'improper' and 'mixed' numbers. (I prefer to call improper fractions 'pure fractions' since there is no 'whole' portion just pure fraction)

- 1.a. $\frac{17}{10}$ b. $\frac{5}{2}$ c. $\frac{23}{5}$ d. $\frac{7}{4}$ e. $\frac{8}{1}$
 2.a. $\frac{11}{4}$ b. $\frac{23}{6}$ c. $\frac{16}{3}$ d. $\frac{12}{1}$ e. $\frac{55}{8}$
 3.a. $2\frac{1}{4}$ b. $4\frac{1}{5}$ c. $1\frac{1}{2}$ d. $2\frac{1}{4}$ e. $3\frac{4}{5}$
 4.a. $5\frac{3}{8}$ b. $6\frac{2}{5}$ c. $5\frac{1}{2}$ d. $1\frac{1}{3}$ e. $6\frac{1}{2}$
 5.a. $7\frac{1}{3}$ b. $5\frac{1}{7}$ c. $2\frac{1}{2}$ d. $6\frac{3}{4}$ e. $5\frac{1}{8}$

LESSON 7 – MULTIPLICATION OF MIXED NUMBERS

(rename as pure improper fractions first; reduce, multiply, write as Mixed number if necessary)

- 1.a. $22\frac{2}{3}$ b. 42 c. 57
 2.a. 2 b. 3 c. $2\frac{1}{2}$
 3.a. $\frac{5}{12}$ b. $\frac{15}{16}$ c. 7
 4.a. 4 b. $1\frac{1}{2}$ c. $\frac{1}{2}$
 5.a. 4 b. $\frac{5}{9}$ c. $2\frac{1}{12}$

LESSON 7 – PROBLEM SOLVING

1. 9kg 2. $1\frac{1}{6}$ 3. $9\frac{9}{10}$ 4. 22
 5. 36 6. $93\frac{1}{3}$ 7. 276 8. $13\frac{14}{15}$

LESSON 8 – RECIPROCALIf I wash my dog three times every five months, $\frac{3}{5}$, then it takes five months for every three washes, $\frac{5}{3}$. We are saying the same thing just upside down!

- 1.a. Yes b. Yes c. No
 2.a. No b. Yes c. No
 3.a. $\frac{6}{5}$ b. $\frac{8}{7}$ c. $\frac{3}{1}$ d. $\frac{1}{6}$ e. $\frac{1}{4}$ f. $\frac{1}{8}$
 4.a. $\frac{2}{5}$ b. $\frac{3}{10}$ c. $\frac{4}{5}$ d. $\frac{9}{4}$ e. $\frac{1}{5}$ f. $\frac{8}{25}$
 5.a. $\frac{3}{14}$ b. $\frac{10}{1}$ c. $\frac{1}{12}$ d. $\frac{5}{8}$ e. $\frac{12}{7}$ f. $\frac{16}{45}$

LESSON 9 – DIVISION

Division is easy, same as multiply with one extra step first

- 1.a. $1\frac{1}{2}$ b. $\frac{2}{3}$ c. $1\frac{1}{4}$ d. $1\frac{1}{6}$
 2.a. $1\frac{3}{4}$ b. 6 c. $1\frac{3}{5}$ d. $1\frac{1}{3}$
 3.a. 10 b. $1\frac{1}{6}$ c. $\frac{3}{10}$ d. $\frac{5}{6}$
 4.a. $11\frac{2}{3}$ b. 22 c. $41\frac{1}{3}$ d. $1\frac{1}{2}$
 5.a. 25 b. $2\frac{5}{7}$ c. $\frac{2}{3}$ d. $4\frac{1}{2}$

LESSON 10 – DIVISION WITH MIXED NUMBERS

- 1.a. $\frac{3}{4}$ b. 4 c. $\frac{1}{4}$ d. 4
 2.a. 1 b. $\frac{4}{5}$ c. $1\frac{4}{45}$ d. $\frac{18}{25}$
 3.a. $\frac{7}{15}$ b. $1\frac{7}{20}$ c. 2 d. $\frac{5}{2}$
 4.a. $2\frac{2}{3}$ b. $1\frac{1}{2}$ c. $\frac{17}{32}$ d. $2\frac{2}{3}$

LESSON 10 PROBLEM SOLVING

1. 15L 2. 55L 3. 9 lessons 4. $1\frac{3}{4}$ hours
 5. 6 people 6. 15 pages/hr 7. 5 containers; $\frac{1}{3}$ of another

LESSON 11 ADDITION AND SUBTRACTION

Adding and subtracting fractions is fairly difficult at first!

- 1.a. $\frac{4}{5}$ b. $1\frac{5}{8}$ c. $1\frac{1}{2}$ d. $\frac{1}{5}$ e. $\frac{3}{8}$ f. $\frac{1}{4}$
 2.a. $\frac{4}{5}$ b. $\frac{1}{2}$ c. $\frac{3}{4}$ d. $\frac{1}{6}$ e. $\frac{1}{3}$ f. 0
 3.a. $\frac{7}{8}$ b. $1\frac{3}{7}$ c. $2\frac{1}{2}$ d. 1 e. $1\frac{4}{5}$ f. $2\frac{1}{4}$

LESSON 11 PROBLEM SOLVING

1. $1\frac{1}{5}$ 2. $\frac{3}{5}$ 3. $1\frac{1}{8}$ 4. $\frac{1}{2}$
 5. $\frac{1}{4}$ 6. $\frac{1}{6}$ 7. $\frac{1}{2}$ 8. $1\frac{12}{12}$
lol, who the heck breaks time into twelfths? Isn't that like 5 minutes?

LESSON 12 – EQUIVALENT FRACTIONS

(this is pretty much 'un-reducing'; 'un-simplifying', making the numerator and denominator bigger. Don't mess with any whole number part)

- 1.a. $\frac{8}{16}$ b. $\frac{9}{12}$ c. $\frac{9}{15}$
 2.a. $\frac{8}{10}$ b. $\frac{35}{45}$ c. $\frac{15}{36}$
 3.a. $\frac{21}{24}$ b. $\frac{5}{30}$ c. $\frac{25}{60}$
 4.a. $1\frac{4}{6}$ b. $2\frac{25}{40}$ c. $4\frac{2}{8}$
 5.a. $3\frac{16}{18}$ b. $6\frac{42}{60}$ c. $7\frac{20}{24}$

LESSON 13 ADDITION AND SUBTRACTION

Adding fractions with different denominators and no common factor in denominator (different size slices of pizza) is quite a bit more work, but not too hard!

- 1.a. $1\frac{4}{15}$ b. $1\frac{1}{12}$ c. $1\frac{5}{24}$ d. $1\frac{1}{6}$
 2.a. $\frac{1}{10}$ b. $\frac{7}{15}$ c. $\frac{5}{24}$ d. $\frac{1}{12}$
 3.a. $5\frac{3}{20}$ b. $6\frac{17}{40}$ c. $6\frac{1}{6}$ d. $7\frac{29}{30}$
 4.a. $2\frac{1}{6}$ b. $3\frac{1}{30}$ c. $\frac{1}{12}$ d. $1\frac{13}{60}$

LESSON 14 – ADDITION AND SUBTRACTION

Sometimes you only need to rename one fraction, the other(s) can stay the same

- 1a. $1\frac{1}{4}$ b. $1\frac{5}{8}$ c. $1\frac{2}{9}$ d. $\frac{3}{4}$
 2a. $4\frac{3}{4}$ b. $10\frac{3}{16}$ c. $12\frac{1}{8}$ d. $7\frac{2}{3}$
 3a. $\frac{2}{5}$ b. $\frac{1}{2}$ c. $\frac{3}{8}$ d. $\frac{5}{16}$
 4a. $1\frac{1}{6}$ b. $3\frac{3}{8}$ c. $3\frac{7}{20}$ d. $2\frac{1}{12}$

LESSON 14 - PROBLEM SOLVING

1. $\frac{1}{8}$ \$ 2. $1\frac{5}{8}$ \$ 3. $4\frac{3}{8}$ \$ 4. $24\frac{1}{2}$ \$
 5. $3\frac{1}{8}$ \$ 6. $\frac{1}{12}$ L 7. $5\frac{2}{5}$ kg

LESSON 15 – ADDITION AND SUBTRACTION

Adding and Subtracting when denominators have a common factor

- 1a. $\frac{13}{24}$ b. $\frac{11}{12}$ c. $\frac{17}{30}$ d. $1\frac{5}{18}$
 2a. $3\frac{1}{20}$ b. $5\frac{19}{30}$ c. $10\frac{29}{36}$ d. $13\frac{8}{15}$
 3a. $\frac{1}{12}$ b. $\frac{1}{18}$ c. $\frac{19}{48}$ d. $\frac{4}{75}$
 4a. $1\frac{7}{12}$ b. $3\frac{1}{30}$ c. $4\frac{1}{10}$ d. $6\frac{13}{30}$

LESSON 15 PROBLEM SOLVING

1. $1\frac{7}{12}$ hours 2. Wednesday; $\frac{1}{15}$ hours 3. $1\frac{13}{20}$ hours
 4. $2\frac{5}{16}$ minutes 5. Second problem, $\frac{1}{8}$ minutes
 6. Brenda, $\frac{49}{60}$ longer 7. $\frac{7}{12}$ hours

SUBTRACTION (With Renaming)

(sometimes you have to borrow from the whole number and rename the numbers!)

- 1a. $6\frac{1}{8}$ b. $8\frac{7}{10}$ c. $2\frac{1}{2}$ d. $1\frac{3}{7}$
 2a. $1\frac{3}{4}$ b. $2\frac{13}{15}$ c. $5\frac{1}{8}$ d. $\frac{5}{6}$
 3a. $1\frac{1}{4}$ b. $1\frac{5}{6}$ c. $4\frac{1}{6}$ d. $2\frac{7}{24}$
 4a. $4\frac{5}{6}$ b. $\frac{13}{30}$ c. $2\frac{35}{36}$ d. $4\frac{19}{20}$

LESSON 16 PROBLEM SOLVING

1. $1\frac{1}{4}$ hours 2. $\frac{7}{30}$ hours 3. $2\frac{7}{20}$ hours
 4. $1\frac{7}{40}$ hours 5. $1\frac{1}{2}$ hours

lol, who the heck says: "see you in $7/30^{\text{th}}$ s of an hour!". Isn't that really 14 minutes since you earth people do time in 60^{mins} !

PRACTICE TEST

- 1a. $\frac{4}{9}$ b. $\frac{2}{3}$ c. $\frac{4}{15}$ d. $\frac{1}{4}$
 2a. 90 b. 6 c. $6\frac{2}{3}$ d. $38\frac{1}{2}$
 3a. $\frac{24}{25}$ b. $2\frac{11}{12}$ c. $10\frac{2}{3}$ d. 4
 4a. $\frac{4}{5}$ b. $1\frac{4}{9}$ c. $8\frac{1}{12}$ d. $3\frac{2}{15}$
 5a. $\frac{3}{5}$ b. $\frac{27}{56}$ c. $4\frac{3}{4}$ d. $1\frac{7}{10}$

There, that was not a bad 5 or 6 hours of effort. Now you are good to go on any trade!