

Fractions

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This worksheet provides arithmetic practice problems involving fractions.

Questions

Question 1

Simplify the following fraction:

$$\frac{2}{6}$$

[file 00043](#)

Question 2

Simplify the following fraction:

$$\frac{135}{20}$$

[file 00042](#)

Question 3

Simplify the following fraction:

$$\frac{3}{3 + 3 + 3 + 3}$$

[file 00044](#)

Question 4

Simplify the following fraction:

$$\frac{8 + 8 + 8 + 8}{8 + 8}$$

[file 00045](#)

Question 5

What fraction of 200 is 25?

[file 00062](#)

Question 6

Convert this mixed number to an improper fraction (where the numerator exceeds the denominator):

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

[file 00048](#)

Question 7

Convert this mixed number to an improper fraction (where the numerator exceeds the denominator):

$$25\frac{7}{16}$$

[file 00049](#)

Question 8

Convert this improper fraction into a mixed number:

$$\frac{38}{5}$$

[file 00051](#)

Question 9

Convert this improper fraction into a mixed number:

$$\frac{233}{16}$$

[file 00050](#)

Question 10

Add the following fractions:

$$\frac{1}{2} + \frac{1}{4}$$

[file 00039](#)

Question 11

Add the following fractions:

$$\frac{1}{5} + \frac{3}{4}$$

[file 00037](#)

Question 12

Add the following fractions:

$$\frac{7}{12} + \frac{5}{8}$$

[file 00056](#)

Question 13

Add the following fractions:

$$\frac{48}{72} + \frac{33}{132}$$

[file 00055](#)

Question 14

Add the following fractions:

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

[file 00053](#)

Question 15

Add the following fractions:

$$\frac{11}{5} + \frac{3}{4} + \frac{3}{2}$$

file 00054

Question 16

Add these mixed numbers together:

$$4\frac{1}{2} + 5\frac{3}{4}$$

file 00052

Question 17

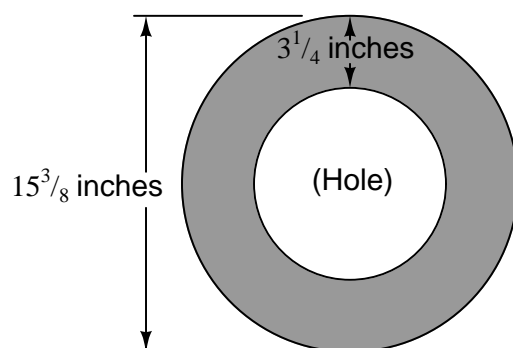
Subtract the following fractions:

$$\frac{2}{3} - \frac{2}{5}$$

file 00038

Question 18

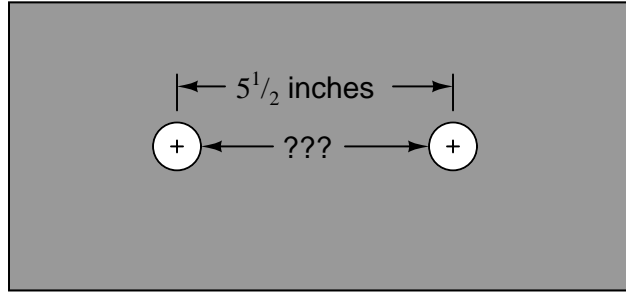
What is the diameter of the hole?



file 00072

Question 19

Calculate the distance between hole edges, assuming each hole has a diameter of $\frac{7}{8}$ inch:



file 00073

Question 20

Multiply the following fractions:

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

file 00040

Question 21

Multiply the following fractions:

$$\frac{15}{4} \times \frac{8}{11}$$

file 00041

Question 22

Simplify the following fraction:

$$\frac{\left(\frac{3}{4}\right)}{\left(\frac{1}{2}\right)}$$

file 00046

Question 23

Simplify the following expression:

$$\left(\frac{3}{8}\right)^2$$

file 00063

Question 24

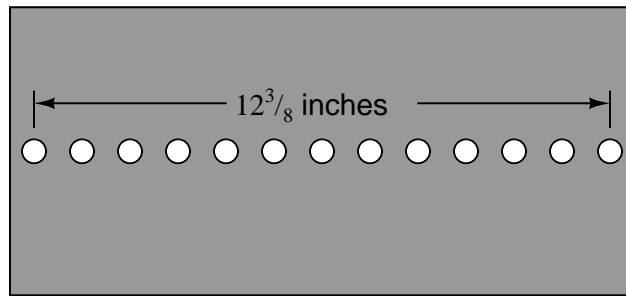
Divide the following fractions:

$$\frac{12}{5} \div \frac{3}{10}$$

file 00047

Question 25

Calculate the distance between hole centers, assuming equal spacing between holes. Express this distance as a fraction.



file 00074

Question 26

Enter the following fractions in your calculator, as if they were division problems (i.e. $\frac{2}{9} = 2 \div 9$):

$$\frac{2}{9}$$

$$\frac{5}{9}$$

$$\frac{11}{99}$$

$$\frac{47}{99}$$

$$\frac{521}{999}$$

$$\frac{8334}{9999}$$

Do you notice any consistent patterns in the answers given by your calculator?

file 00057

Question 27

Without using a calculator, determine what the decimal value is for this fraction:

$$\frac{2}{99}$$

file 00058

Question 28

Write a fraction representing this repeating decimal number:

$$0.\overline{53}$$

file 00059

Question 29

Write a fraction representing this repeating decimal number:

$$0.\overline{200}$$

[file 00060](#)

Question 30

What is the exact sum of these two repeating numbers?

$$0.\overline{4} + 0.\overline{5}$$

[file 00061](#)

Question 31

At one time, Greek mathematicians believed any numerical quantity could be expressed as a fraction of two integer (whole, either negative or positive) numbers. They were wrong. Give at least one example of a number that cannot be exactly expressed as a fraction of two integers. Hint: this category of numbers is called *irrational*.

[file 00064](#)

Question 32

The term "percent" actually refers to a fraction. "per" meaning "divided by," and "cent" meaning 100. Knowing this, how would you express the quantity 13% as a fraction?

[file 00065](#)

Question 33

Express the quantity 125% as a mixed number (whole number plus a fraction).

[file 00066](#)

Question 34

Express the quantity 832% as a mixed number (whole number plus a fraction).

[file 00067](#)

Question 35

What is 37% of $\frac{5}{7}$, expressed as a fraction?

[file 00068](#)

Question 36

What percentage of $\frac{1}{2}$ is $\frac{1}{8}$?

[file 00071](#)

Question 37

What percentage of $\frac{3}{4}$ is $\frac{3}{8}$?

[file 00070](#)

Question 38

What percentage of $\frac{20}{33}$ is $\frac{21}{165}$?

[file 00069](#)

Question 39

The *Doppler effect* is that phenomenon whereby wave frequencies become "shifted" due to relative motion between a wave source and an observer. This effect is known to anyone who has ever heard a police car's siren pitch suddenly fall after the car passes them (the velocity of the car relative to the person changes from a positive value to a negative value when the car passes by).

The following equation describes the "apparent" frequency of a sound source (f'), given the frequency of the source when there is no motion (f), and two velocities, v_a and v_b :

$$f' = \frac{f}{1 + \frac{v_a}{v_b}}$$

Unfortunately, the person who gave you this equation did not indicate the meanings of the two velocity variables. You know that one of these velocities represents the speed of sound in air, while the other represents the relative velocity between the sound source and the observer, but you don't know which is which. However, you should be able to figure this out from your knowledge of fractions.

Hint: when there is no relative motion between the sound source and the observer, $f' = f$.

file 00272

Answers

Answer 1

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

Answer 2

$$\frac{27}{4}$$

Answer 3

$$\frac{1}{4}$$

Answer 4

$$2$$

Answer 5

$$\frac{1}{8}$$

Answer 6

$$\frac{9}{2}$$

Answer 7

$$\frac{407}{16}$$

Answer 8

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

Answer 9

$$14\frac{9}{16}$$

Answer 10

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

Answer 11

$$\frac{19}{20}$$

Answer 12

$$\frac{29}{24}$$

Answer 13

$$\frac{11}{12}$$

Answer 14

$$\frac{11}{6}$$

Answer 15

$$\frac{89}{20}$$

Answer 16

$$\frac{41}{4}, \text{ or } 10\frac{1}{4}$$

Answer 17

$$\frac{4}{15}$$

Answer 18

$$\text{Hole diameter} = 8\frac{7}{8} \text{ inches}$$

Answer 19

$$\text{Distance between hole edges} = 4\frac{5}{8} \text{ inches.}$$

Answer 20

$$\frac{4}{21}$$

Answer 21

$$\frac{30}{11}$$

Answer 22

$$\frac{3}{2}$$

Answer 23

$$\frac{9}{64}$$

Answer 24

$$8$$

Answer 25

$$1\frac{1}{32}$$

Answer 26

The pattern should be rather apparent:

$$\frac{2}{9} = 0.\overline{2}$$

$$\frac{5}{9} = 0.\overline{5}$$

$$\frac{11}{99} = 0.\overline{11}$$

$$\frac{47}{99} = 0.\overline{47}$$

$$\frac{521}{999} = 0.\overline{521}$$

$$\frac{8334}{9999} = 0.\overline{8334}$$

Fractions with 9, 99, 999, 9999, etc. in their denominators generate repeating decimal digits.

Answer 27

$$0.\overline{02}$$

Answer 28

$$\frac{53}{99}$$

Answer 29

$$\frac{200}{999}$$

Answer 30

$$\frac{9}{9}, \text{ or } 1$$

Answer 31

$$\pi, e, \sqrt{2}, \sqrt{3}$$

Answer 32

$$\frac{13}{100}$$

Answer 33

$$1\frac{1}{4}$$

Answer 34

$$8\frac{8}{25}$$

Answer 35

$$\frac{37}{140}$$

Answer 36

$$25\%$$

Answer 37

$$50\%$$

Answer 38

$$21\%$$

Answer 39

v_a = Relative velocity between sound source and observer.

v_b = Velocity of sound in air.

Notes

Notes 1

Notes 2

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Notes 38

Notes 39

This question illustrates a very important and practical application of qualitative mathematical reasoning. I have encountered useful equations quite often in my professional career where the meanings of the variables were not provided, or else were not clear. In order for me to use these equations, I had to figure out what the variables meant, by determining their effects in the equation.