

Lesson 1: Arithmetic ~ Decimals and Fractions

By the end of the lesson, you will be able to:

- ~ Add, Subtract, Multiply, & Divide Integers
- ~ Add, Subtract, Multiply, & Divide Decimals
- ~ Add, Subtract, Multiply, & Divide Fractions

Lesson 1: Arithmetic ~ Decimals and Fractions

Integer Rules

positive + positive

- Add, answer positive

Examples

a.) $98 + 53 = \boxed{151}$

$$\begin{array}{r} 98 \\ + 53 \\ \hline 151 \end{array}$$

b.) $57 + (-33) = \boxed{24}$

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Integer Rules

positive + negative

- Subtract as positives (biggest on top)
- Answer is sign of biggest number

Examples

a.) $-55 + (-21) = \boxed{-34}$ b.) $135 + (-42) = \boxed{+93}$

$$\begin{array}{r} 55 \\ -21 \\ \hline -34 \end{array}$$

$$\begin{array}{r} 135 \\ -42 \\ \hline 93 \end{array}$$

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Integer Rules

negative + negative

- Add, answer is negative

Examples

a.) $-21 + (-33) = \boxed{-54}$

$$\begin{array}{r} 21 \\ + 33 \\ \hline 54 \end{array}$$

b.) $-12 - 51 = \boxed{-63}$

$$\begin{array}{r} 12 \\ - 51 \\ \hline 63 \end{array}$$

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Integer Rules

positive \times or \div positive

- Do \times or \div then answer is positive

Examples

a.) $5 \times 8 =$ 40

b.) $11 \cdot 3 =$ 33

c.) $22 \div 11 =$ 2

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Integer Rules

negative \times or \div positive

- Do \times or \div then answer is negative

Examples

a.) $-4 \times 7 =$ -28

b.) $12 \cdot (-3) =$ -36

c.) $-48 \div 12 =$ -4

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Integer Rules

negative × or ÷ negative

- Do \times or \div then answer is positive

Examples

a.) $-3 \times (-10) =$ 30

b.) $-10 \cdot (-12) =$ 120

c.) $-56 \div (-8) =$ 7

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Decimal Rules

Add and Subtract

- Line up decimals,
- Add or subtract as usual
- Bring decimal straight down

Examples

a.) $1.2 + 5.678 = \boxed{6.878}$

$$\begin{array}{r} 1.200 \\ + 5.678 \\ \hline 6.878 \end{array}$$

b.) $-3.25 + 7.056 = \boxed{3.806}$

$$\begin{array}{r} 7.056 \\ - 3.250 \\ \hline 3.806 \end{array}$$

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Decimal Rules

Multiply

- Do not line up decimals (easier to put longer number on top)
- Multiply as usual
- Count over from right **total** decimal places

Examples

a.) $6.8 \times 1.25 =$ 8.5

$$\begin{array}{r} & ^3 \\ & ^4 \\ 1 & . & 2 & 5 \\ \times & & 6 & . & 8 \\ \hline & 1 & 0 & 0 & 0 \\ + & 7 & 5 & 0 & 0 \\ \hline & 8 & 5 & 0 & 0 \end{array}$$

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Examples

b.) $(-33)(1.356) =$ -44.748

$$\begin{array}{r} 1.356 \\ \times 33 \\ \hline 4068 \\ 40680 \\ - 44748 \end{array}$$

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Decimal Rules

Divide $12 \div 2$

$$2 \overline{)12}$$

- First or top number inside division symbol
- Move decimal on outside number all the way right
- Move decimal on inside number the same amount
- Long division as usual
- Move decimal straight up

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Examples

a.) $144 \div (-8) = \boxed{-18}$

$$\begin{array}{r} -18 \\ 8 \overline{)144} \\ -8 \downarrow \\ 64 \\ -64 \\ \hline 0 \end{array}$$

b.) $1.25 \div 0.05 = \boxed{25}$

$$25 \overline{)125}$$

$$\begin{array}{r} 25 \\ 5 \overline{)125.} \\ -10 \downarrow \\ 25 \\ -25 \\ \hline 0 \end{array}$$

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Examples

c.) $132 \div 0.11 =$

1200

d.) $2.56 \div 0.4 =$

6.4

$$\begin{array}{r} 132.00 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 1200. \\ \hline 11 \overline{)13200.} \\ -11 \\ \hline 22 \\ -22 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 256 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 6.4 \\ \hline 4 \overline{)25.6} \\ -24 \\ \hline 16 \\ -16 \\ \hline 0 \end{array}$$

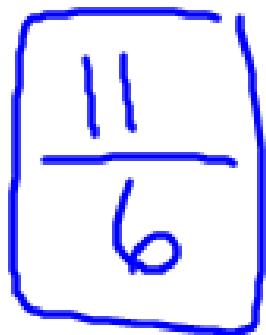
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Fraction Rules

Multiply

- Change any mixed numbers to fractions
- Reduce (cancel) everything possible
- Multiply straight across

Examples

a.) $\frac{3}{4} \times \frac{22}{3} =$ 

The equation $\frac{3}{4} \times \frac{22}{3}$ is shown. The fraction $\frac{3}{4}$ has a blue '3' crossed out with a blue arrow. The fraction $\frac{22}{3}$ has a blue '22' crossed out with a blue arrow. The result is a blue box containing the fraction $\frac{11}{6}$.

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Examples

b.) $\left(1\frac{4}{5}\right)\left(3\frac{3}{4}\right) =$

$$\left(\frac{9}{5}\right)\left(\frac{15}{4}\right) = \boxed{\frac{27}{4}}$$

c.) $\left(\frac{1}{8}\right)\left(-5\frac{1}{3}\right) =$

$$\left(\frac{1}{8}\right)\left(-\frac{16}{3}\right) = \boxed{-\frac{2}{3}}$$

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Fraction Rules

Divide

- Change any mixed numbers to fractions
- Turn the second number upside down (reciprocal)
- Change divide to multiply
- Reduce (cancel) everything possible
- Multiply straight across

To divide fractions, we must do KFC. KFC stands for:

K - Keep 1st fraction as is.

F - Flip the 2nd fraction (reciprocal).

C - Change the divide to a multiply.

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Examples

a.) $\frac{2}{3} \div \left(-\frac{5}{12}\right) = \frac{2}{3} \cdot -\frac{12}{5}$

$= \boxed{-\frac{8}{5}}$

c.) $5\frac{1}{4} \div \frac{1}{4} =$

b.) $(-1\frac{3}{5}) \div \left(\frac{6}{15}\right) =$

$= \left(\frac{-8}{5}\right) \cdot \frac{15}{6}$

$= \frac{-4}{1} = \boxed{-4}$

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Fraction Rules

Add and Subtract

- Get a least common denominator for all fractions
- Add or subtract numerators as usual *top*
- Leave denominator the same
- Reduce as far as possible (no mixed numbers)

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Examples

a.) $\frac{1}{5} + \frac{3}{5} = \boxed{\frac{4}{5}}$

b.) $-\frac{3}{5} - \frac{1}{3} = \frac{9}{15} - \frac{5}{15}$
= $\boxed{-\frac{14}{15}}$

c.) $-\frac{5}{6} + \frac{7}{8} = \frac{-20}{24} + \frac{21}{24} = \boxed{\frac{1}{24}}$

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By the end of the lesson, you will be able to:

- ~ Add, Subtract, Multiply, & Divide
Integers, Decimals, & Fractions

Can you?

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Homework:

Assignment 1