Compute with Rational Numbers
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1. Simplify the following expression.

\((-29) ÷ 29\)

- A. -58
- B. 58
- C. -17
- D. 0

2. Simplify the following expression.

\((-24) ÷ (-4)\)

- A. -9
- B. -6
- C. 6
- D. 9

3. Simplify the following expression.

\(8 × (-5)\)

- A. -40
- B. -48
- C. 40
- D. 48

4. Simplify the following expression.

\(25 ÷ (-5)\)

- A. 5
- B. 6
- C. -5
- D. -6

5. Simplify the following expression.

\((-12) ÷ 4\)

- A. -3
- B. 3
- C. 6
- D. -6

6. Simplify the following expression.
7. Simplify the following expression.

\[ 18 + (-15) \]

- [ ] A. -3
- [ ] B. 3
- [ ] C. 33
- [ ] D. -33

8. Simplify the following expression.

\[ (-25) - 9 \]

- [ ] A. 34
- [ ] B. 16
- [ ] C. -34
- [ ] D. -16

9. Simplify the following expression.

\[ (-11) \times 4 \]

- [ ] A. -44
- [ ] B. -15
- [ ] C. 44
- [ ] D. -55

10. Simplify the following expression.

\[ 27 - (-17) \]

- [ ] A. -44
- [ ] B. 10
- [ ] C. -10
- [ ] D. 44

11. Simplify the following expression.

\[ \frac{1}{2} + \frac{5}{12} \]

- [ ]
12. Simplify the following expression.

\[ \frac{2}{3} + \frac{4}{15} \]

- A. \( \frac{2}{5} \)
- B. \( \frac{2}{7} \)
- C. \( \frac{14}{15} \)
- D. \( \frac{7}{15} \)

13. Simplify the following expression.

\[ \frac{11}{20} - \frac{1}{4} \]

- A. \( \frac{7}{20} \)
- B. \( \frac{13}{80} \)
- C. \( \frac{3}{16} \)
- D. \( \frac{3}{8} \)

14. Simplify the following expression.

\[ \frac{43}{60} - \frac{1}{2} \]

- A. \( \frac{13}{60} \)
- B. \( \frac{1}{5} \)
- C. \( \frac{21}{20} \)
- D. \( \frac{22}{60} \)
15. Simplify the following expression.

\[ \frac{1}{3} \times \frac{9}{10} \]

- A. \( \frac{1}{3} \)
- B. \( \frac{10}{13} \)
- C. \( \frac{4}{13} \)
- D. \( \frac{3}{10} \)

16. Simplify the following expression.

\[ \frac{8}{10} \times \frac{1}{6} \]

- A. \( \frac{2}{5} \)
- B. \( \frac{9}{11} \)
- C. \( \frac{45}{11} \)
- D. \( \frac{2}{3} \)

17. Simplify the following expression.

\[ \frac{1}{2} \div \frac{1}{10} \]

- A. 5
- B. 1 1/3
- C. \( \frac{1}{20} \)
- D. \( \frac{1}{5} \)

18. Simplify the following expression.

\[ \frac{9}{100} \div \frac{7}{12} \]

- A. \( \frac{27}{175} \)
- B. \( \frac{27}{175} \)
- C. \( \frac{27}{175} \)
- D. \( \frac{27}{175} \)
19. Simplify the following complex fraction.

\[
\frac{1.275 \div \frac{5}{3}}{\frac{5}{3}}
\]

- A. \(\frac{85}{24}\)
- B. \(\frac{21}{10}\)
- C. \(\frac{22}{20}\)
- D. \(\frac{23}{40}\)

20. Simplify the following complex fraction.

\[
\frac{0.4}{0.5 \times \frac{3}{4}}
\]

- A. \(\frac{16}{35}\)
- B. \(\frac{7}{20}\)
- C. \(\frac{5}{7}\)
- D. \(\frac{7}{8}\)

21. Simplify the following expression.

\[7.304 - 0.49\]

- A. 6.814
- B. 6.851
- C. 72.55
- D. 6.737

22. Simplify the following expression.

\[70.766 - 70.74\]

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23. Simplify the following expression.

81.44 + 6

- A. 82.04
- B. 141.44
- C. 14.144
- D. 87.44

24. Simplify the following expression.

2.42 + 0.002

- A. 2.4202
- B. 2.4202
- C. 2.422
- D. 2.436

25. Simplify the following expression.

9.835 - 0.99

- A. 8.915
- B. 8.935
- C. 8.845
- D. 9.736

26. Simplify the following expression.

84.9 × 4.1

- A. 352
- B. 33.6
- C. 348.09
- D. 696.18

27. Simplify the following expression.

2.44 × 0.43

- A. 9.6
- B. 0.10492

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28. Simplify the following expression.

\[ 8.108 \times 3.2 \]

- A. 25.9456
- B. 17.8376
- C. 25.9776
- D. 259.456

29. Simplify the following expression.

\[ 51.2 \div 8 \]

- A. 6.8
- B. 6.4
- C. 6.4
- D. 7.3

30. Simplify the following expression.

\[ 65.12 \div 8.8 \]

- A. 7.4
- B. 7.2
- C. 8.3
- D. 7.9

Answers

1. D
2. C
3. A
4. C
5. A
6. D
7. B
8. C
9. A
10. D
11. A
12. C
13. C
14. A
15. D
16. D
17. A
18. A
19. C
20. A

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Explanations

1. A negative number plus a positive number is equal the positive number minus the absolute value of the negative number.

\[ (-29) + 29 = 29 - | -29 | \]
\[ = 29 - 29 \]
\[ = 0 \]

2. A negative number divided by a negative number is equal to the quotient of the absolute values of the numbers.

\[ (-24) \div (-4) = | -24 | \div | -4 | \]
\[ = 24 \div 4 \]
\[ = 6 \]

3. A positive number times a negative number is equal to the negative of the product of the absolute values of the numbers.

\[ 8 \times (-5) = -(|8| \times | -5 |) \]
\[ = -(8 \times 5) \]
\[ = -40 \]

4. A positive number divided by a negative number is equal to the negative of the quotient of the absolute values of the numbers.

\[ 25 \div (-5) = -(|25| \div | -5 |) \]
\[ = -(25 \div 5) \]
\[ = -5 \]

5. A negative number divided by a positive number is equal to the negative of the quotient of the absolute values of the numbers.

\[ (-12) \div 4 = -(| -12 | \div |4|) \]
\[ = -(12 \div 4) \]
\[ = -3 \]

6. A negative number times a negative number is equal to the product of the absolute values of the numbers.

\[ (-10) \times (-9) = | -10 | \times | -9 | \]

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7. A positive number plus a negative number is equal to the positive number minus the absolute value of the negative number.

\[ 18 + (-15) = 18 - |15| \]
\[ = 18 - 15 \]
\[ = 3 \]

8. A negative number minus a positive number is equal to the negative of the sum of the absolute values of the numbers.

\[ (-25) - 9 = -(|25| + |9|) \]
\[ = -(25 + 9) \]
\[ = -34 \]

9. A negative number times a positive number is equal to the negative of the product of the absolute values of the numbers.

\[ (-11) \times 4 = -(|11| \times |4|) \]
\[ = -(11 \times 4) \]
\[ = -44 \]

10. A positive number minus a negative number is equal to the positive number plus the absolute value of the negative number.

\[ 27 - (-17) = 27 + |17| \]
\[ = 27 + 17 \]
\[ = 44 \]

11. First, find a common denominator. Since the denominators are 2 and 12, let 12 be the common denominator and rewrite the problem using the common denominator.

\[ \frac{1}{2} + \frac{5}{12} = \frac{6}{12} + \frac{5}{12} \]

Now that the denominators are the same, add the numerators. Reduce, if necessary.

\[ \frac{6}{12} + \frac{5}{12} = \frac{6 + 5}{12} \]
\[ = \frac{11}{12} \]

12. First, find a common denominator. Since the denominators are 3 and 15, let 15 be the common denominator and rewrite the problem using the common denominator.

\[ \frac{2}{3} + \frac{4}{15} = \frac{10}{15} + \frac{4}{15} \]
Now that the denominators are the same, add the numerators. Reduce, if necessary.

\[
\frac{10}{15} + \frac{1}{15} = \frac{10 + 4}{15} = \frac{14}{15}
\]

13. First, find a common denominator. Since the denominators are 20 and 4, let 20 be the common denominator and rewrite the problem using the common denominator.

\[
\frac{11}{20} - \frac{1}{4} = \frac{11}{20} - \frac{5}{20}
\]

Now that the denominators are the same, subtract the numerators. Reduce, if necessary.

\[
\frac{11}{20} - \frac{5}{20} = \frac{11 - 5}{20} = \frac{6}{20} = \frac{3}{10}
\]

14. First, find a common denominator. Since the denominators are 60 and 2, let 60 be the common denominator and rewrite the problem using the common denominator.

\[
\frac{43}{60} - \frac{1}{2} = \frac{43}{60} - \frac{30}{60}
\]

Now that the denominators are the same, subtract the numerators. Reduce, if necessary.

\[
\frac{43}{60} - \frac{30}{60} = \frac{43 - 30}{60} = \frac{13}{60}
\]

15. Multiply the numerators together and the denominators together, and then simplify the results.

\[
\frac{1}{3} \times \frac{9}{10} = \frac{1 \times 9}{3 \times 10} = \frac{9}{30} = \frac{3}{10}
\]

16. Multiply the numerators together and the denominators together, and then simplify the results.

\[
\frac{5}{6} \times \frac{4}{5} = \frac{5 \times 4}{6 \times 5} = \frac{20}{30} = \frac{2}{3}
\]

17. To divide the fractions, multiply the first fraction by the reciprocal of the second fraction.

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\[
\frac{1}{2} \div \frac{1}{10} = \frac{1}{2} \times \frac{10}{1} = \frac{10}{2} = \frac{5}{1}
\]

18. To divide the fractions, multiply the first fraction by the reciprocal of the second fraction.

\[
\frac{\frac{9}{100}}{\frac{7}{12}} = \frac{9}{100} \times \frac{12}{7} = \frac{108}{700} = \frac{27}{175}
\]

19. First, convert the decimal number to a fraction in reduced form.

\[
1.375 = 1 \frac{375}{1000} = 1 \frac{3}{8} = \frac{11}{8}
\]

Next, find the quotient in the numerator.

\[
\frac{\frac{11}{8} + \frac{2}{18}}{\frac{2}{3}} = \frac{11 \times \frac{2}{3}}{\frac{2}{3}} = \frac{22}{6} = \frac{11}{3}
\]

Finally, multiply the fraction in the numerator by the reciprocal of the fraction in the denominator and reduce.

\[
\frac{\frac{11}{3} \times \frac{18}{5}}{\frac{5}{6}} = \frac{198}{60} = \frac{33}{10}
\]

20. First, convert the decimal numbers to fractions in reduced form.

\[
0.4 = \frac{4}{10} = \frac{2}{5}
\]

\[
0.5 = \frac{5}{10} = \frac{1}{2}
\]

Next, find the product in the denominator.

\[
\frac{\frac{3}{4} \times \frac{1}{2}}{\frac{3}{6}} = \frac{1}{2}
\]

Then, multiply the fraction in the numerator by the reciprocal of the fraction in the denominator.
21. First, line up the decimal points of the two numbers. Subtract the digits in the thousandths column. 4 - 0 = 4.

\[
\begin{array}{c}
7.304 \\
- \ 0.490 \\
\hline
4
\end{array}
\]

Subtract the digits in the hundredths column. Since 0 is less than 9, use regrouping to take one tenth from the tenths column, and add that tenth (10 hundredths) to the 0 hundredths (10+0=10), then subtract. 10 - 9 = 1.

\[
\begin{array}{c}
7.304 \\
- \ 0.490 \\
\hline
14
\end{array}
\]

Subtract the digits in the tenths column. Since 2 is less than 4, use regrouping to take one one from the ones column, and add that one (10 tenths) to the 2 tenths (10+2=12), then subtract. 12 - 4 = 8.

\[
\begin{array}{c}
12.04 \\
- \ 3.204 \\
\hline
814
\end{array}
\]

Subtract the digits in the ones column. 6 - 0 = 6.

\[
\begin{array}{c}
6.304 \\
- \ 3.304 \\
\hline
3.814
\end{array}
\]

Therefore, 7.304 - 0.490 = 6.814.

22. First, line up the decimal points of the two numbers. Subtract the digits in the thousandths column. 6 - 0 = 6.

\[
\begin{array}{c}
70.766 \\
- \ 70.740 \\
\hline
6
\end{array}
\]

Subtract the digits in the hundredths column. 6 - 4 = 2.

\[
\begin{array}{c}
70.766 \\
- \ 70.740 \\
\hline
26
\end{array}
\]

Subtract the digits in the tenths column. 7 - 7 = 0.

\[
\begin{array}{c}
70.766 \\
- \ 70.740 \\
\hline
26
\end{array}
\]

Subtract the digits in the ones column. 0 - 0 = 0.

\[
\begin{array}{c}
70.766 \\
- \ 70.740 \\
\hline
26
\end{array}
\]
Subtract the digits in the tens column. \( 7 - 7 = 0 \).

\[
\begin{array}{c}
70.766 \\
- 70.740 \\
\hline
00.026
\end{array}
\]

Therefore, \( 70.766 - 70.740 = 0.026 \).

23. Make sure to line up the decimal points when adding decimals.

Add the digits in the right column. \( 4 + 0 = 4 \). Place the 4 below:

\[
\begin{array}{c}
81.44 \\
+ 6.00 \\
\hline
4
\end{array}
\]

Now, add the next column to the left. \( 4 + 0 = 4 \). Place the 4 below:

\[
\begin{array}{c}
81.44 \\
+ 6.00 \\
\hline
44
\end{array}
\]

Now, add the next column to the left. \( 1 + 6 = 7 \). Place the 7 below:

\[
\begin{array}{c}
81.44 \\
+ 6.00 \\
\hline
74.44
\end{array}
\]

Now, bring the rest of 81.44 down:

\[
\begin{array}{c}
81.44 \\
+ 6 \\
\hline
87.44
\end{array}
\]

Therefore, \( 81.44 + 6 = 87.44 \).

24. Make sure to line up the decimal points when adding decimals.

Add the digits in the right column. \( 0 + 2 = 2 \). Place the 2 below:

\[
\begin{array}{c}
2.420 \\
+ 0.002 \\
\hline
2
\end{array}
\]

Now, add the next column to the left. \( 2 + 0 = 2 \). Place the 2 below:

\[
\begin{array}{c}
2.420 \\
+ 0.002 \\
\hline
22
\end{array}
\]

Now, add the next column to the left. \( 4 + 0 = 4 \). Place the 4 below:

\[
\begin{array}{c}
2.420 \\
+ 0.002 \\
\hline
224
\end{array}
\]
Now, add the next column to the left. 2 + 0 = 2. Place the 2 below:

\[
\begin{array}{c}
2.420 \\
+ 0.002 \\
\hline
2.422
\end{array}
\]

Therefore, \(2.42 + 0.002 = 2.422\).

25. First, line up the decimal points of the two numbers. Subtract the digits in the thousandths column. 5 - 0 = 5.

\[
\begin{array}{c}
9.835 \\
- 0.990 \\
\hline
5
\end{array}
\]

Subtract the digits in the hundredths column. Since 3 is less than 9, use regrouping to take one tenth from the tenths column, and add that tenth (10 hundredths) to the 3 hundredths (10+3=13), then subtract. 13 - 9 = 4.

\[
\begin{array}{c}
9.8435 \\
- 0.990 \\
\hline
45
\end{array}
\]

Subtract the digits in the tenths column. Since 7 is less than 9, use regrouping to take one one from the ones column, and add that one (10 tenths) to the 7 tenths (10+7=17), then subtract. 17 - 9 = 8.

\[
\begin{array}{c}
7.9435 \\
- 0.990 \\
\hline
845
\end{array}
\]

Subtract the digits in the ones column. 8 - 0 = 8.

\[
\begin{array}{c}
8.835 \\
- 0.990 \\
\hline
8.845
\end{array}
\]

Therefore, \(9.835 - 0.990 = 8.845\).

26. To multiply decimals, first rewrite the problem, ignoring the decimal points: 849 \times 41.

Now, solve.

\[
\begin{array}{c}
849 \\
\times 41
\end{array}
\]

multiply \(849 \times 1\):

\[
849
\]

multiply \(849 \times 40\):

\[
33960
\]

add the results together:

\[
34809
\]

Finally, move the decimal point of the solution to the left to equal the total number of decimal places in the original factors.

In this case, 84.9 has 1 decimal place, and 4.1 has 1 decimal place, for a total of 2 decimal places.

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Move the decimal point of the solution 2 places to the left. Therefore, the solution is 348.09.

27. To multiply decimals, first rewrite the problem, ignoring the decimal points: 244 × 43.

Now, solve.

\[
\begin{array}{c}
244 \\
× 43 \\
\hline
\end{array}
\]

multiply 244 × 3: 732
multiply 244 × 40: 9,760
add the results together: 10,492

Finally, move the decimal point of the solution to the left to equal the total number of decimal places in the original factors.

In this case, 2.44 has 2 decimal places, and 0.43 has 2 decimal places, for a total of 4 decimal places.

Move the decimal point of the solution 4 places to the left.

Therefore, the solution is 1.0492.

28. To multiply decimals, first rewrite the problem, ignoring the decimal points: 8,108 × 32.

Now, solve.

\[
\begin{array}{c}
8108 \\
× 32 \\
\hline
\end{array}
\]

multiply 8108 × 2: 16,216
multiply 8108 × 30: 243,240
add the results together: 259,456

Finally, move the decimal point of the solution to the left to equal the total number of decimal places in the original factors.

In this case, 8.108 has 3 decimal places, and 3.2 has 1 decimal place, for a total of 4 decimal places.

Move the decimal point of the solution 4 places to the left.

Therefore, the solution is 25.9456.

29.

\[
\begin{array}{c}
0.64 \\
\times 51.2 \\
\hline
0.32 \\
.48 \\
\hline
0.000
\end{array}
\]

1. The decimal point in your answer will line up with the decimal point of the dividend. Fill in zeros as needed.
2. Divide 51 by 8 to get 6 plus a remainder. Place 48 below 51.
3. Subtract 48 from 51 to get 3. Bring the 2 down from 51.2.
4. Divide 32 by 8 to get 4. Place 32 below 32.
5. Subtract 32 from 32 to get 0.
30. For the divisor 8.8, move the decimal 1 place to the right to get rid of the decimal point. Do the same for the dividend.

8.8 becomes 88
65.12 becomes 651.2

Now do the division as you normally would.

\[
\begin{array}{c}
  \underline{88 \div 651.2} \\
  \underline{.616} \\
  \underline{.0352} \\
  \underline{.0000}
\end{array}
\]

1. The decimal point in your answer will line up with the decimal point of the dividend. Fill in zeros as needed.
2. Divide 651 by 88 to get 7 plus a remainder. Place 616 below 651.
3. Subtract 616 from 651 to get 35. Bring the 2 down from 651.2.
4. Divide 352 by 88 to get 4. Place 352 below 352.
5. Subtract 352 from 352 to get 0.