Addition & Subtraction of Fractions & Mixed Numbers

Adding & Subtracting Fractions

1. Find a common denominator.
2. Add or subtract the two numerators and keep the denominator the same.
3. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $\frac{1}{3}+\frac{1}{6}$

$$\begin{array}{r} \frac{1}{3}\times\frac{2}{2}=\frac{2}{6} \\ +\ \frac{1}{6}\times\frac{1}{1}=\frac{1}{6} \\ \hline \frac{3}{6}\div\frac{3}{3}=\boxed{\frac{1}{2}} \end{array}$$

Adding Mixed Numbers

1. Find a common denominator.
2. Add the two numerators and keep the denominator the same.
3. Add the whole numbers.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{3}{4}+1\frac{2}{3}$

$$\begin{array}{r} 2\frac{3}{4}=2\frac{9}{12} \\ +\ 1\frac{2}{3}=1\frac{8}{12} \\ \hline 3\frac{17}{12}=\boxed{4\frac{5}{12}} \end{array}$$

Subtracting Mixed Numbers

1. Find a common denominator.
2. Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.
3. Subtract the whole numbers
4. Simplify the answer.

ex: $3\frac{1}{4}-1\frac{1}{3}$

$$\begin{array}{r} 3\frac{1}{4}=3\frac{3}{12}+\frac{12}{12}=2\frac{15}{12} \\ -\ 1\frac{1}{3}=1\frac{4}{12}\qquad\quad=1\frac{4}{12} \\ \hline \boxed{1\frac{11}{12}} \end{array}$$

Find the sum. Write your answer in simplest form.

1. $\frac{1}{4} + \frac{1}{2}$	2. $\frac{2}{5} + \frac{1}{3}$	3. $\frac{7}{15} + \frac{3}{10}$	4. $\frac{11}{28} + \frac{4}{7}$
5. $\frac{3}{4} + \frac{1}{12}$	6. $\frac{9}{10} + \frac{13}{20}$	7. $4\frac{15}{16} + 7\frac{3}{4}$	8. $2\frac{16}{25} + 3\frac{18}{20}$
9. $3\frac{2}{5} + 9\frac{1}{10}$	10. $6\frac{1}{42} + 4\frac{5}{6}$	11. $18\frac{7}{9} + 16$	12. $4\frac{7}{8} + \frac{1}{3}$

Find the difference. Write your answer in simplest form.

13. $\frac{7}{8} - \frac{1}{4}$	14. $\frac{13}{15} - \frac{1}{3}$	15. $\frac{7}{9} - \frac{2}{6}$	16. $\frac{21}{24} - \frac{3}{8}$
17. $\frac{3}{14} - \frac{1}{7}$	18. $\frac{9}{10} - \frac{1}{2}$	19. $9 - 4\frac{1}{12}$	20. $12\frac{18}{25} - 8\frac{4}{5}$
21. $5\frac{8}{9} - 3\frac{2}{3}$	22. $8\frac{12}{16} - 7\frac{31}{32}$	23. $10\frac{3}{4} - 6\frac{4}{5}$	24. $13\frac{7}{8} - \frac{10}{12}$

Multiplication & Division of Fractions & Mixed Numbers

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Cross-simplify if possible.
3. Multiply the numerators and then multiply the denominators
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{4} \cdot \frac{1}{3}$

$\frac{\cancel{3}}{4} \cdot \frac{1}{\cancel{3}_{1}} = \boxed{\frac{3}{4}}$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.
3. Multiply the fractions.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$\frac{7}{1} \div \frac{7}{4}$

$\frac{7}{1} \cdot \frac{4}{\cancel{7}_{1}} = \frac{4}{1} = \boxed{4}$

Find the product. Write your answer in simplest form.

25. $\frac{1}{8} \cdot \frac{1}{7}$	26. $\frac{2}{9} \cdot \frac{12}{14}$	27. $\frac{7}{12} \cdot \frac{8}{14}$	28. $\frac{9}{24} \cdot \frac{16}{81}$
29. $\frac{3}{14} \cdot \frac{21}{33}$	30. $\frac{1}{2} \cdot \frac{9}{13}$	31. $2\frac{1}{6} \cdot \frac{3}{5}$	32. $8\frac{4}{5} \cdot 1\frac{5}{11}$
33. $2\frac{1}{2} \cdot \frac{2}{5}$	34. $9\frac{2}{3} \cdot 6$	35. $13\frac{1}{3} \cdot 2\frac{1}{10}$	36. $7 \cdot \frac{1}{3}$

Find the quotient. Write your answer in simplest form.

37. $\frac{5}{6} \div \frac{1}{4}$	38. $\frac{1}{2} \div \frac{1}{4}$	39. $\frac{3}{4} \div \frac{9}{12}$	40. $\frac{21}{35} \div \frac{7}{25}$
41. $\frac{6}{7} \div 3$	42. $\frac{2}{11} \div \frac{1}{33}$	43. $1\frac{1}{4} \div 2\frac{1}{3}$	44. $5\frac{3}{6} \div 3$
45. $10\frac{1}{4} \div \frac{2}{5}$	46. $3\frac{2}{3} \div 1\frac{1}{7}$	47. $4\frac{3}{8} \div \frac{9}{10}$	48. $8 \div \frac{3}{4}$

Operations with Decimals

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.
2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.
3. Add/subtract as if the numbers are whole numbers
4. Bring the decimal point straight down

ex: 10.03 + 5.2

$$\begin{array}{r} 10.03 \\ +\ 5.20 \\ \hline 15.23 \end{array}$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.
2. Ignore the decimals and multiply as if the numbers are whole numbers.
3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 1.03 x 2.8

$$\begin{array}{r} 1.03 \\ \times\ 2.8 \\ \hline 824 \\ +\ 2060 \\ \hline 2884 \end{array} \rightarrow 2.884$$

2 decimal places + 1 decimal place = 3 decimal places

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.
2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.
3. Divide as if the numbers are both whole numbers.
4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: 25.3 ÷ 0.3

$$\begin{array}{r} 84.\overline{3} \\ 0.3\overline{)25.30} \\ -24 \\ \hline 13 \\ -12 \\ \hline 10 \\ -\ 9 \\ \hline 1 \end{array}$$

Find the sum or difference.

49. $6.2 + 3.4$	50. $8.04 - 6.8$	51. $12.4 + 0.899$	52. $12.9 - 2.043$
53. $163.29 + 13.987$	54. $13 - 6.7$	55. $3.91 + 1.93$	56. $34.2 - 29.027$

Find the product.

57. $9.2 \cdot 3.1$	58. $(14.1)(2.7)$	59. 91×4.5	60. 82.04×1.2
61. $(1.1)(6.78)$	62. $45 \cdot 0.1$	63. 0.010×13.9	64. $(2.34)(5.6)$

Find the quotient.

65. $8.4 \div 2$	66. $1.56 \div 1.3$	67. $7.45 \div 2$	68. $9 \div 0.8$
69. $68 \div 3.4$	70. $9.4 \div 0.2$	71. $0.045 \div 0.15$	72. $4 \div 0.3$

Geometry

Area Formulas

*** Remember that area is the space *inside* a figure! ***

- Area of a Rectangle = length x width
- Area of a Parallelogram = base x height
- Area of a Triangle = ½ base x height
- Area of a Circle = π x radius^2

Perimeter Formulas

*** Remember that perimeter is the distance *around* a figure! ***

- Perimeter of Any Polygon: add up all of the side lengths
- Circumference of a Circle = 2 x π x radius

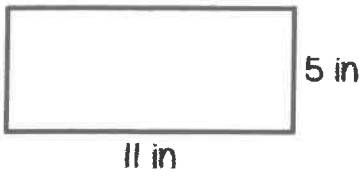
Volume Formula

*** Remember that volume is the capacity of a 3D figure! ***

- Volume of a Rectangular Prism: length x width x height

Find the area and perimeter (or circumference) of each figure. Use 3.14 for π.

73.



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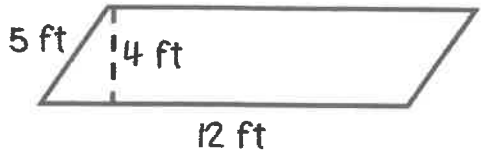

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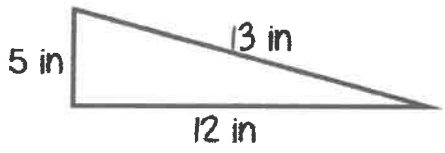

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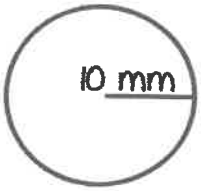
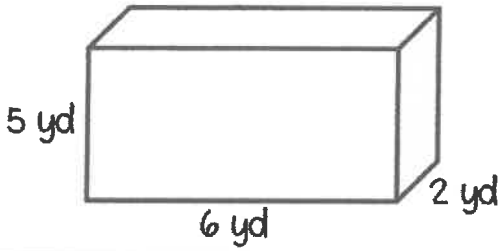


Find the volume.

77.



Solve each word problem.

78. Danny is installing a fence around his rectangular yard. His yard is 20 feet long by 45 feet wide. If the fencing he picked out costs $25 per foot, how much money will Danny spend on the fence?

79. Tameka wants to put a carpet in her rectangular bedroom. Her room is 22 feet long by 18 feet wide. How much carpeting will Tameka need?

80. Don wants to bring some sand home from his vacation at the beach. He has a box that is 3 inches wide, 4 inches long, and 2 inches tall. How much sand can he fit in the box?

One-Step Equations

Addition Equations

Subtract the number being added to the variable from both sides of the equation

ex: $4 + x = 18$
$-4 \quad -4$
$x = 14$

Subtraction Equations

Add the number being subtracted from the variable to both sides of the equation

ex: $20 = a - 5$
$+5 \quad +5$
$25 = a \rightarrow a = 25$

Multiplication Equations

Divide both sides of the equation by the number next to the variable

ex: $\frac{7b}{7} = \frac{28}{7}$
$b = 4$

Division Equations

Multiply both sides of the equation by the number under the variable

ex: $5 \cdot \frac{n}{5} = 10 \cdot 5$
$n = 50$

Solve each one-step equation for the given variable.

81. $x + 18 = 32$	82. $18f = 720$	83. $h - 56 = 57$	84. $\frac{b}{6} = 12$
85. $12 = r - 76$	86. $33 + d = 65$	87. $14m = 42$	88. $10c = 5$
89. $38 = 19j$	90. $w + 65 = 100$	91. $r - 7 = 9$	92. $x \div 12 = 9$
93. $14 + x = 18$	94. $\frac{p}{22} = 7$	95. $47 = x - 5$	96. $k + 16 = 76$
97. $2 = 6m$	98. $t - 8 = 14$	99. $\frac{h}{19} = 11$	100. $47 = 18 + b$