

Whole Numbers Practice Problems

Whole Numbers

- **Natural numbers and whole numbers**
 - **Digits and numerals**
 - **Place value notation**
 - **Rounding a whole number**
 - **Operations and operators**
-

Solutions can be found in the
Basic Math Quick Reference

Handbook Pages 1 - 4

e-book Pages 11 - 14

What is another name for the natural numbers?

What is the difference between the natural numbers and the whole numbers?

How many digits are there?

What is a numeral?

Write numerals for the following numbers:

4 Hundreds + 5 Tens + 2 Ones =

2 Hundreds + 4 Tens + 5 Ones =

32 thousand =

25 million =

10 billion, 987 million, 654 thousand =

Write 2,405 In expanded form.

Round 347 to the nearest

Hundred;

Thousand;

Ten;

What is the difference between a mathematical operation and an operator?

Whole Numbers Practice Problems

▪ Adding whole numbers

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 5 - 8
e-book Pages 15 18

$11 + 7 =$	$9 + 8 =$	$10 + 9 =$	$14 + 3 =$
$9 + 4 =$	$12 + 2 =$	$8 + 6 =$	$5 + 4 =$
$8 + 5 =$	$10 + 4 =$	$12 + 5 =$	$10 + 2 =$
$12 + 7 =$	$16 + 3 =$	$13 + 3 =$	$8 + 8 =$
$16 + 2 =$	$7 + 4 =$	$5 + 2 =$	$6 + 5 =$
$9 + 6 =$	$10 + 6 =$	$13 + 4 =$	$12 + 6 =$
$6 + 3 =$	$11 + 5 =$	$4 + 4 =$	$5 + 3 =$
$11 + 2 =$	$8 + 2 =$	$15 + 2 =$	$12 + 3 =$
$13 + 2 =$	$11 + 8 =$	$14 + 5 =$	$9 + 3 =$
$6 + 6 =$	$7 + 6 =$	$8 + 4 =$	$8 + 3 =$
$7 + 3 =$	$2 + 2 =$	$12 + 4 =$	$13 + 6 =$
$14 + 2 =$	$3 + 2 =$	$7 + 2 =$	$4 + 3 =$
$13 + 5 =$	$15 + 4 =$	$10 + 7 =$	$3 + 3 =$
$5 + 5 =$	$7 + 5 =$	$10 + 5 =$	$9 + 7 =$
$15 + 3 =$	$11 + 6 =$	$10 + 3 =$	$17 + 2 =$
$6 + 4 =$	$9 + 2 =$	$7 + 7 =$	$11 + 4 =$
$10 + 8 =$	$14 + 4 =$	$11 + 3 =$	$8 + 7 =$
$6 + 2 =$	$9 + 5 =$	$4 + 2 =$	

Mentally add:

$342 + 0 =$

$3 + 5 + 6 =$

$2 + 6 + 8 + 3 + 4 =$

Find the sum of:

214, 31, and 2

123, 45, and 6

547, 37, and 49

Whole Numbers Practice Problems

▪ Subtracting whole numbers

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 9 - 11
e-book Pages 19 - 21

$11 - 6 =$ $18 - 9 =$ $16 - 8 =$ $17 - 8 =$

$15 - 9 =$ $13 - 5 =$ $16 - 9 =$ $11 - 7 =$

$12 - 9 =$ $14 - 7 =$ $11 - 2 =$ $17 - 9 =$

$16 - 7 =$ $12 - 6 =$ $14 - 9 =$ $12 - 3 =$

$14 - 6 =$ $11 - 9 =$ $13 - 7 =$ $15 - 6 =$

$12 - 8 =$ $15 - 8 =$ $11 - 8 =$ $12 - 7 =$

$13 - 6 =$ $12 - 4 =$ $14 - 5 =$ $11 - 4 =$

$13 - 9 =$ $15 - 7 =$ $11 - 5 =$ $14 - 8 =$

$11 - 3 =$ $13 - 8 =$ $13 - 4 =$ $12 - 5 =$

$8 - 0 =$

$5 - 5 =$

$345 - 21 =$

$162 - 15 =$

Whole Numbers Practice Problems

▪ Multiplying whole numbers

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 12 - 15
e-book Pages 22 - 25

$5 \times 7 =$ $6 \times 4 =$ $8 \times 9 =$ $7 \times 6 =$

$3 \times 3 =$ $2 \times 2 =$ $7 \times 2 =$ $9 \times 4 =$

$7 \times 4 =$ $8 \times 4 =$ $8 \times 8 =$ $6 \times 8 =$

$6 \times 9 =$ $3 \times 8 =$ $2 \times 4 =$ $9 \times 5 =$

$3 \times 7 =$ $6 \times 5 =$ $5 \times 8 =$ $7 \times 7 =$

$8 \times 2 =$ $5 \times 5 =$ $6 \times 6 =$ $4 \times 3 =$

$4 \times 4 =$ $7 \times 9 =$ $2 \times 5 =$ $3 \times 6 =$

$5 \times 3 =$ $5 \times 4 =$ $6 \times 2 =$ $9 \times 2 =$

$3 \times 9 =$ $2 \times 3 =$ $8 \times 7 =$ $9 \times 9 =$

Write two statements that show that multiplication of 3×5 is repeated addition.

Write 12 times 3 in five different ways.

Mentally multiply:

$342 \times 1 =$

$0 \times 1 =$

$342 \times 0 =$

$0 \times 0 =$

$5 \times 3 \times 2 =$

Find the product of 123 and 4.

$123 \times 24 =$

$112 \times 201 =$

$123 \times 40 =$

$12332 \times 12000 =$

Whole Numbers Practice Problems

- **Dividing whole numbers**
- **Divisibility rules**

Page 1 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 16 - 21
e-book Pages 26 - 31

$63 \div 9 =$	$30 \div 6 =$	$56 \div 7 =$	$15 \div 5 =$
$48 \div 8 =$	$18 \div 9 =$	$12 \div 4 =$	$56 \div 8 =$
$16 \div 2 =$	$64 \div 8 =$	$72 \div 9 =$	$20 \div 4 =$
$48 \div 6 =$	$18 \div 6 =$	$20 \div 5 =$	$12 \div 2 =$
$28 \div 7 =$	$40 \div 5 =$	$36 \div 6 =$	$63 \div 7 =$
$28 \div 4 =$	$27 \div 9 =$	$32 \div 8 =$	$42 \div 7 =$
$25 \div 5 =$	$12 \div 3 =$	$54 \div 6 =$	$32 \div 4 =$
$42 \div 6 =$	$81 \div 9 =$	$18 \div 3 =$	$40 \div 8 =$
$21 \div 3 =$	$35 \div 5 =$	$18 \div 2 =$	$24 \div 8 =$
$45 \div 5 =$	$14 \div 7 =$	$27 \div 3 =$	$24 \div 4 =$
$36 \div 9 =$	$16 \div 4 =$	$15 \div 3 =$	$36 \div 4 =$
$24 \div 3 =$	$35 \div 7 =$	$14 \div 2 =$	$24 \div 6 =$
$45 \div 9 =$	$72 \div 8 =$	$12 \div 6 =$	$21 \div 7 =$
$30 \div 5 =$	$54 \div 9 =$	$16 \div 8 =$	$49 \div 7 =$

In the expression $12 \div 3 = 4$ or $3 \overline{)12}^4$:

Which number is the dividend?

Which number is the divisor?

Which number is the quotient?

Write 12 divided by 3 in four different ways.

Whole Numbers Practice Problems

- **Dividing whole numbers**
- **Divisibility rules**

Page 2 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 16 - 21
e-book Pages 26 - 31

$$342 \div 1 =$$

$$0 \div 5 =$$

$$6 \div 3 =$$

$$7 \div 2 =$$

$$14 \div 5 =$$

$$\frac{6}{0} =$$

$$\frac{0}{0} =$$

$$174 \div 2 =$$

$$165 \div 2 =$$

$$1371 \div 25 =$$

Estimate the answer: $37 \overline{)132} =$

How do you know that:

720, 40, and 3450 are divisible by 10?

365, 130, and 75 are divisible by 5?

3080, 716, and 2308 are divisible by 4?

1,800, 2,016, and 1,000,000 are divisible by 8?

123, 2811, and 1218 are divisible by 3?

252, 36, and 1089 are divisible by 9?

Whole Numbers Practice Problems

- **Multiples of a whole number**
- **Factors of a whole number**
- **Prime and composite numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 22 - 27
e-book Pages 32 - 37

Write a few multiples of 3.

Of the numbers 9, 700, 71, 14, and 57 which are multiples of 7?

Write a few multiples of 20.

Write the numbers that have a multiple of 24.

Which number is a common multiple of 1, 3, and 5?

Which number is a common multiple of 1, 2, 4, 5, 10, 20, 25, and 50?

Find three common multiples of 4 and 6.

Find the least common multiple of 8 and 12.

Find all the factors of 24.

Find all factors of 12.

Find all factors of 20.

Find the common factors of 40 and 64.

Find the greatest common factor of 24 and 36.

Write ten prime numbers less than 100.

Why are 4, 6, 10, 12, and 22 composite numbers?

Draw prime factor trees for 12 and 8. then use them to find the GCF and LCM of 12 and 8.

Fractions

- **Fraction, numerator, and denominator**
- **Fractions as division**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 28 - 29
e-book Pages 38 - 39

$\frac{3}{4}$ is a fraction that represents _____ parts of a whole that was divided into _____ equal parts. It is read as “_____” or “_____”.

The fraction $\frac{3}{4}$ has a numerator of _____ and denominator of _____.

Write 1 as three different fractions.

$\frac{3}{5}$ and $\frac{1}{5}$ have a _____ denominator.

Write the following fractions as division statements:

$$\frac{1}{2} = \div = \overline{\hspace{1cm}}$$

$$\frac{1}{3} = \div = \overline{\hspace{1cm}}$$

$$\frac{1}{4} = \div = \overline{\hspace{1cm}}$$

$$\frac{2}{3} = \div = \overline{\hspace{1cm}}$$

$$\frac{3}{4} = \div = \overline{\hspace{1cm}}$$

Write the quotient with a
fractional remainder.

$$\begin{array}{r} 82 \text{ r}1 \\ 2 \overline{)165} \end{array}$$

Fractions Practice Problems

- **Proper & improper fractions, mixed numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 30
e-book Page 40

Mark each fraction as proper or improper:

$$\frac{4}{5} \quad \frac{10}{2} \quad \frac{1}{8} \quad \frac{6}{5} \quad \frac{8}{8}$$

$5\frac{3}{4}$ is a _____ number that represents 5 whole objects and $\frac{3}{4}$ of another object. It is read as “_____”.

Fractions Practice Problems

▪ Fractional equivalence and conversions

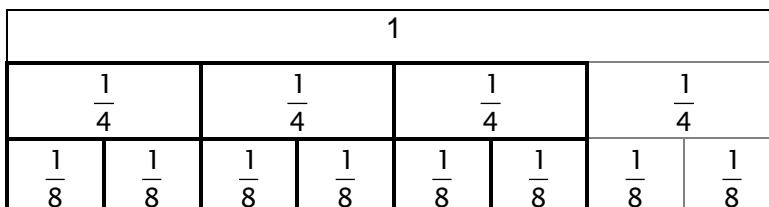
Page 1 of 2

Solutions can be found in the
Basic Math Quick Reference

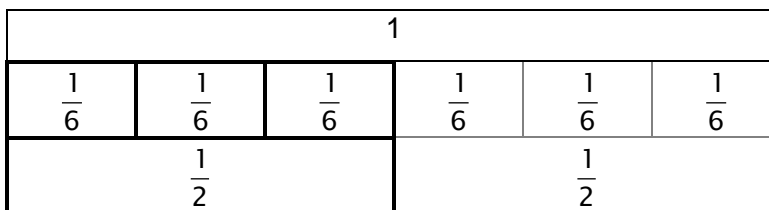
Handbook Pages 31 - 38

e-book Pages 41 - 48

Which two fractions are shown to be equal in the picture?



Which two fractions are shown to be equal in the picture?



Show that equal fractions have equal cross-products:

$$\frac{3}{4} = \frac{6}{8}$$

$$\frac{1}{2} = \frac{12}{24}$$

Which fractions are in lowest terms?

$$\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}$$

Write in simplest form:

$$\frac{2}{8} =$$

$$\frac{4}{8} =$$

Fractions Practice Problems

▪ Fractional equivalence and conversions

Page 2 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 31 - 38
e-book Pages 41 - 48

Write in higher terms:

$$\frac{1}{8} = \frac{\quad}{24}$$

$$\frac{2}{3} = \frac{\quad}{15}$$

$$\frac{3}{10} = \frac{\quad}{40}$$

Simplify:

$$\frac{11}{7} =$$

$$\frac{8}{4} =$$

$$\frac{11}{4} =$$

Write as improper fractions:

$$8 =$$

$$5 =$$

$$12 =$$

$$1 =$$

Write as improper fractions:

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

$$6\frac{3}{4} =$$

Simplify:

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

$$\frac{11}{7} =$$

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

Find the least common denominator of $\frac{1}{2}$, $\frac{5}{6}$, and $\frac{3}{8}$.

Write fractions equivalent to $\frac{3}{4}$ and $\frac{1}{10}$ that have a common denominator.

Fractions Practice Problems

- **Ordering fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 39
e-book Page 49

Arrange in ascending order: $\frac{3}{7}, \frac{1}{7}, \frac{6}{7}, \frac{4}{7}$

Arrange in descending order: $\frac{4}{5}, \frac{1}{5}, \frac{2}{5}$

Order $\frac{5}{9}, \frac{2}{5},$ and $\frac{2}{3}$.

Fractions Practice Problems

- **Adding numbers that include fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 40 - 45
e-book Pages 50 - 55

$$\frac{1}{5} + \frac{2}{5} =$$

$$\frac{10}{17} + \frac{3}{17} =$$

$$5\frac{3}{7} + 2 + \frac{1}{7} + 3\frac{2}{7} =$$

$$\frac{4}{9} + \frac{1}{4} + \frac{1}{6} =$$

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

$$\frac{1}{5} + \frac{2}{5} =$$

$$\frac{4}{15} + \frac{8}{15} =$$

$$2\frac{3}{8} + 2\frac{1}{8} + 1\frac{1}{8} + \frac{1}{8} =$$

$$\frac{2}{7} + \frac{5}{7} =$$

$$\frac{1}{3} + \frac{5}{6} + \frac{8}{9} =$$

$$2\frac{1}{6} + 2\frac{2}{5} + \frac{13}{30} =$$

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

$$\frac{1}{3} + \frac{8}{9} + \frac{4}{6} =$$

Fractions Practice Problems

- **Subtracting numbers that include fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 46 - 51
e-book Pages 56 - 61

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

$$\frac{15}{99} - \frac{5}{99} =$$

$$4\frac{3}{5} - 1\frac{1}{5} =$$

$$8\frac{5}{7} - \frac{3}{7} =$$

$$5\frac{1}{2} - 2 =$$

$$\frac{3}{8} - \frac{1}{4} =$$

$$6\frac{4}{5} - 2\frac{1}{2} =$$

$$2 - \frac{1}{2} =$$

$$5 - 1\frac{1}{7} =$$

$$8\frac{1}{4} - \frac{3}{4} =$$

$$5\frac{1}{6} - 2\frac{3}{4} =$$

$$7\frac{2}{3} - 2\frac{1}{3} =$$

$$\frac{8}{9} - \frac{4}{6} =$$

$$3\frac{3}{4} - 1\frac{1}{4} =$$

Fractions Practice Problems

- **Multiplying numbers that include fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 52 - 57
e-book Pages 62 - 67

$$\frac{1}{2} \times \frac{3}{4} =$$

$$\frac{1}{2} \times \frac{3}{10} \times \frac{1}{2} \times \frac{1}{4} =$$

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

$$\frac{2}{5} \times 1\frac{1}{3} =$$

$$4\frac{1}{2} \times 2\frac{1}{3} =$$

$$4 \times \frac{2}{7} =$$

$$2\frac{1}{4} \times 3 =$$

$$1\frac{1}{2} \times 2\frac{1}{2} =$$

$$\frac{3}{8} \times 1\frac{2}{3} \times 4 =$$

$$\frac{3}{10} \times \frac{5}{6} \times \frac{1}{3} =$$

Write the reciprocal of each fraction:

$$\frac{5}{2}$$

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

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

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

The product of a fraction and its reciprocal is always equal to _____.

Fractions Practice Problems

- **Dividing numbers that include fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 58 - 61
e-book Pages 68 - 71

Divide 4 by $1\frac{1}{2}$.

$$\frac{1}{5} \div 1\frac{1}{2} =$$

$$3 \div \frac{1}{2} =$$

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

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

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

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

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

Decimal Numbers Practice Problems

Decimal Numbers

- **Representing wholes and parts as decimal numbers**
- **Rounding a decimal number to a specific place value**
- **Ordering decimal numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 63 - 66
e-book Pages 73 - 76

Write as decimal numbers:

Four tenths =

Three hundredths =

Two thousandths =

8 =

604 =

Five and three tenths =

$85\frac{2}{100} =$

ninety-two and six hundred forty-eight thousandths =

sixty-seven hundredths =

forty-two thousandths =

eight and three hundred one thousandths =

Simplify:

$.020 =$

$3.1000 =$

Round 192.8704:

to the nearest ten

to the nearest thousandth

to the nearest whole number

Order 7.099, 7.5, and 7.20

Decimal Numbers Practice Problems

- **Types of decimal numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 67
e-book Page 77

Label each decimal numbers as:

(T)	terminating
(NTR)	non-terminating, repeating
(NTNR)	non-terminating, non-repeating

.333...

.2

1.7320508075688772935274463415059...

6.5

1.486...

$6.\bar{3}$

.28571428571428571428571428571428...

.375

.4142135623730950488016887242097...

Decimal Numbers Practice Problems

- **Adding decimal numbers**
- **Subtracting decimal numbers**
- **Multiplying decimal numbers**
- **Dividing decimal numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 68 - 73
e-book Pages 78 - 83

$$38.5 + 6 + 2.73 =$$

$$.24 + 2.4 + 24 =$$

$$8 - .37 =$$

$$94.2 - 6.34 =$$

$$.222 \times 1.3 =$$

$$.06 \times .2 =$$

$$4.2 \times .02 =$$

$$.12345 \times 22 =$$

$$.11 \overline{)2.222} =$$

Divide 2.1 by 5 to the nearest tenth.

Divide 30 by 7 to the nearest hundredth.

Decimal Numbers Practice Problems

- **Decimal numbers and equivalent fractions**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 74 - 76
e-book Pages 84 - 86

Write as decimal numbers:

$$\frac{3}{8} =$$

$$\frac{1}{2} =$$

$$\frac{1}{12} =$$

$$1\frac{3}{8} =$$

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

$$8\frac{3}{4} =$$

$$7\frac{1}{12} =$$

Write as fractions:

$$.3 =$$

$$.014 =$$

$$5.36 =$$

$$.\overline{48} =$$

$$.\overline{3} =$$

$$8.\overline{001} =$$

Which is greater, $\frac{1}{8}$ or .2?

Universal Number Concepts

▪ **Set notation**

Solutions can be found in the
Basic Math Quick Reference

Handbook Page 77

e-book Page 87

Use set notation to describe:

All of the natural numbers

All of the whole numbers

The whole numbers that are between 1 and 4

The numbers between 0 and 2 that are multiples of $\frac{1}{4}$

The decimal numbers that increase by .2 beginning with zero

Universal Number Concepts Practice Problems

▪ Powers

Page 1 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 78 - 84
e-book Pages 88 - 94

Write three powers of 10.

Write three powers of 2.

Write three numbers that have 64 as a power.

Fill in the missing numbers:

___ is the 2nd power of 2.

___ is the 3rd power of 2.

___ is the 1st power of 6.

___ is the 2nd power of 8

___ is the 3rd power of 4

___ is the 6th power of 2.

10 is the first power of ___.

100 is the second power of ___.

___ is the third power of ten.

Universal Number Concepts Practice Problems

▪ Powers

Page 2 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 78 - 84
e-book Pages 88 - 94

Fill in the missing numbers:

3 squared is ___

___ squared is 36

___ squared is 64

$3 \times 3 = 9$ The square root of ___ is 3.

$\sqrt{36} = \underline{\hspace{1cm}}$

The square root of ___ is 8.

1 cubed is ___

___ is the cube of 2.

3 cubed is ___

$\sqrt[3]{1} = \underline{\hspace{1cm}}$

The cube root of ___ is 2.

The cube root of 27 is ___

Find the value of:

$12 \times 10 =$

$10 \div 10 =$

$2.5 \times 10 =$

$2.5 \div 10 =$

$462.04 \times 10 =$

$462.04 \div 10 =$

$5 \times 100 =$

$5 \div 100 =$

$.7 \times 1000 =$

$.7 \div 1000 =$

$2 \div 10 =$

Universal Number Concepts Practice Problems

Exponential notation Page 1 of 2

Solutions can be found in the Basic Math
Quick Reference
Handbook Pages 85 - 89
e-book Pages 95 - 99

2^7 is called an _____.

2 is the _____.

7 is the _____.

Find the value of:

$2^4 =$

$30^2 =$

$5^3 =$

$5^1 =$

Simplify:

$5^3 \times 5^5 =$

$10^4 \times 10^3 =$

$8^3 \times 8^3 \times 8^3 =$

$(10^2)^3 =$

$\frac{10^5}{10^3} =$

$10^6 \div 10^2 =$

Write 12 as the product of primes, using exponential notation for equal factors.

Find the value of each:

$83 \times 10^1 =$

$2.5 \times 10^2 =$

$720 \div 10^2 =$

$.31 \div 10^4 =$

Write 497,000,000,000 in scientific notation.

Universal Number Concepts Practice Problems

▪ Exponential notation

Page 2 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 90 - 93
e-book Pages 100 - 103

Find the value of 2^0 .

Simplify:

$$5^3 \times 5^0 =$$

$$\frac{2^5}{2^0} =$$

Find the value of

$$36^{\frac{1}{2}} =$$

$$\frac{1}{2} \text{ squared} =$$

$$\text{the cube of } \frac{2}{3} =$$

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

Find the value of each:

$$\left(\frac{1}{2}\right)^3 \times \left(\frac{1}{2}\right)^2 =$$

$$\frac{\left(\frac{1}{2}\right)^5}{\left(\frac{1}{2}\right)^2} =$$

Universal Number Concepts Practice Problems

- **Order of operations**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 94 - 96
e-book Pages 104 - 106

Find the value of each:

$$(8 + 4) \times 2 =$$

$$8 + (4 \times 2) =$$

$$\frac{1}{4} \times (2 + \frac{1}{4}) =$$

$$(\frac{1}{4} \times 2) + \frac{1}{4} =$$

$$(60 - .6) \div 2 =$$

$$60 - (.6 \div 2) =$$

$$20 - 2(1 + 1)^3 =$$

$$8 + 4 \times 21 - 12 \div 6 - 4 =$$

$$8 + 4 (21 - 12) \div 6 - 4 =$$

$$8 + 4 (21 - 12) \div (6 - 4) =$$

Universal Number Concepts Practice Problems

- **Properties of numeric operations**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 97 - 100
e-book Pages 107 - 110

Determine which property of operations is demonstrated by each example:

- commutative property
- associative property
- distributive property

$$2 \times (3 \times 4) = (2 \times 3) \times 4$$

$$5 + 2 = 2 + 5$$

$$3(5 - 2) = (3 \times 5) - (3 \times 2)$$

$$2 + (3 + 4) = (2 + 3) + 4$$

$$2(3 + 4) = (2 \times 3) + (2 \times 4)$$

$$2 \times 3 = 3 \times 2$$

Universal Number Concepts Practice Problems

- **Inequality symbols**

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 101
e-book Page 111

Use inequality symbols to express the following statements:

6 is not equal to 4.

2 is less than 9.

$\frac{1}{4}$ is less than $\frac{1}{2}$.

10 is greater than 6.

1 is greater than .6.

18 is less than or equal to 20.

18 is less than or equal to 18.

12 is greater than or equal to 1.

12 is greater than or equal to 12.

Numbers between 5 and 7.

Numbers between 18 and 26, including 18 and 26.

Universal Number Concepts Practice Problems

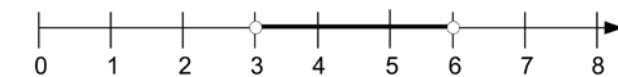
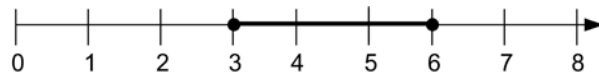
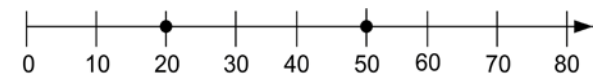
▪ Graphing numbers on a number line

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 102 - 103
e-book Pages 112 - 113

Which is greater, A or B?



Which numbers are graphed on each number line:



Ratios, Proportions, and Percents Practice Problems

Ratios, Proportions, and Percents

- **Ratio**
- **Proportion**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 104 - 105
e-book Pages 114 - 115

If the lengths of two boards of wood are 8 ft. and 10 ft., what is the ratio of the shorter board to the longer board?

Besides saying "10 to 8", two other ways to write this ratio are:

_____and _____.

Which of the following is not a proportion:

$$8:3 = 16:6$$

$$8:6 = 3:16$$

$$3:6 = 8:16$$

Ratios, Proportions, and Percents Practice Problems

▪ Percent

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 106 - 112
e-book Pages 116 - 122

1% of 100 =

1% of 200 =

1% of 1 =

1% of 2 =

1% of a dollar is _____.

If 25% of a collection of coins are dimes, then the ratio of dimes to all coins in the collection is ___ to ___.

Write as decimal numbers:

50% =

100% =

25% =

10% =

3% =

2.5% =

150% =

Write as percents:

.25 =

1 =

.62 =

.005 =

Write as fractions:

3% =

50% =

$\frac{1}{10}$ =

$\frac{1}{4}$ =

Find 25% of 80.

25% of what number = 20?

What percent of 80 is 20?

If the value of something went from 80 to 100, by what percent did it increase?

If the value of something went from 80 to 60, by what percent did it decrease?

Find 110% of 80.

110% of what number = 88?

What percent of 80 is 88?

Probability and Statistics

▪ **Probability of an event**

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 113
e-book Page 123

If you close your eyes and select one coin from a box containing 3 dimes, 1 nickel, and 6 pennies:

What is the probability of selecting a dime?

What is the probability of selecting a nickel?

What is the probability of selecting a penny?

What is the probability of tossing a coin three times and getting all heads?

Probability and Statistics Practice Problems

- **Statistical measures**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 114 - 116
e-book Pages 124 - 126

Find the mean of {12, 20, and 13}.

Find the mode of {12, 15, 20, 13, 15}.

Find the mode of {1, 2, 1, 2, 1}.

Find the mode of {6, 1, 2, 3, 2, 7, 6}.

Find the mode of {8, 6, 4, 5, 23, 2}.

Find the median of {12, 20, and 13}.

Find the median of {12, 20, 13, and 15}.

Find the median of {4, 4, 5, 6}.

Find the median of {1, 2, 4, 4, 6, 8}.

Find the range of {12, 20, 13, 15}.

Geometry and Measurement

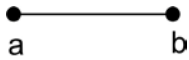
▪ **Angles and lines**

Solutions can be found in the
Basic Math Quick Reference

Handbook Pages 117 - 119

e-book Pages 127 - 129

Use mathematical notation to describe the following:

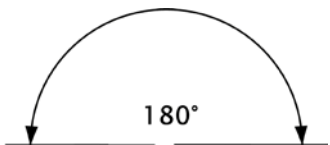
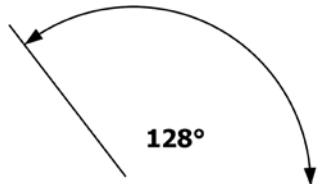
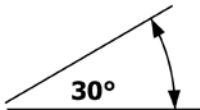
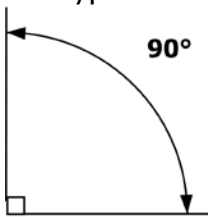


“Zero degrees”

“Twenty-four degrees”

“One hundred degrees”

Identify the type of each angle:



Draw two perpendicular lines.

Draw two parallel lines.

Geometry and Measurement Practice Problems

▪ Polygons

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 119 - 121
e-book Pages 129 - 131

How do you recognize a polygon?

What is a quadrilateral?

Identify each polygon below, and list:

Whether it is regular or irregular

Which sides are equal

Which angles are right angles

Which angles are equal



List the characteristics of each type of triangle:

Right triangle

Isosceles triangle

Equilateral triangle

Scalene triangle

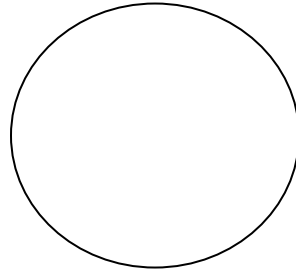
What does the Pythagorean Theorem state?

Geometry and Measurement Practice Problems

- **Circles**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 122 - 123
e-book Pages 132 - 133

On a circle, identify the circumference, radius, and diameter.



π is the ratio of the _____ to the _____ of a circle?

Which decimal number and fraction are used as approximations of π ?

If you know the radius of a circle, how would you find its diameter?

If you know the radius of a circle, how would you find its circumference?

Geometry and Measurement Practice Problems

▪ Length

Solutions can be found in the
Basic Math Quick Reference
Handbook Page 124
e-book Page 134

Fill in the missing numbers or units of measure:

$$1 \text{ foot (ft)} = \text{_____ inches (in)}$$

$$1 \text{ yard (yd)} = \text{_____ feet} = \text{_____ inches}$$

$$1 \text{ mile (mi)} = \text{_____ feet}$$

$$3'' = 3 \text{ _____}$$

$$5' = 5 \text{ _____}$$

$$1 \text{ yard (yd)} = \text{_____ ' } = \text{_____ ''}$$

$$1 \text{ meter (m)} = \text{_____ centimeters} = \text{_____ millimeters}$$

$$1 \text{ centimeter (cm)} = \text{_____ millimeters} = .01 \text{ _____}$$

$$1 \text{ millimeter (mm)} = . \text{_____ meters}$$

$$1 \text{ kilometer (km)} = \text{_____ meters}$$

$$1'' = 2.54 \text{ _____}$$

$$1 \text{ _____} = 39.37 \text{ ''}$$

Geometry and Measurement Practice Problems

▪ Perimeter

Solutions can be found in the
Basic Math Quick Reference

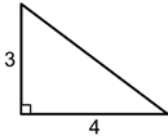
Handbook Page 125

e-book Page 135

Describe how you would find the perimeter of each figure:



What is the perimeter of this triangle?

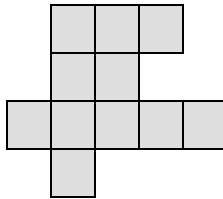
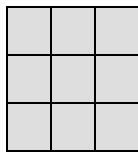
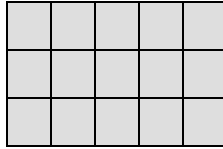


Geometry and Measurement Practice Problems

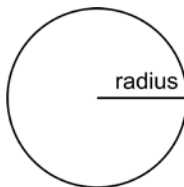
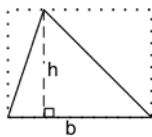
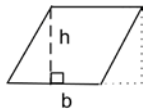
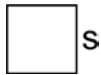
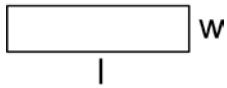
Area

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 126 - 127
e-book Pages 136 - 137

Find the area of each shaded region. (Assume each square has a 1 inch side.)



How would you find the area of each figure below?

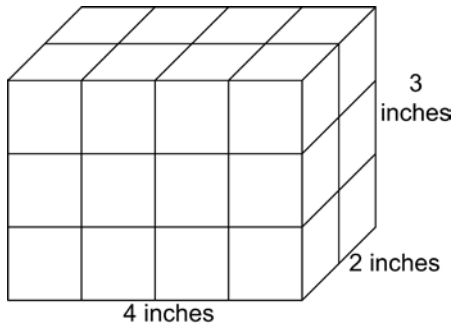


Geometry and Measurement Practice Problems

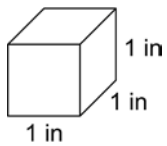
- **Surface area**
- **Volume**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 128 - 129
e-book Pages 138 - 139

What is the surface area and volume of this rectangular prism?



What is the volume of this figure?



Positive and Negative Numbers Practice Problems

Positive and Negative Numbers

- **Signed numbers and the number line**
- **Sign and absolute value**
- **Opposites**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 130 - 135
e-book Pages 140 - 145

Write as positive or negative numbers:

Having \$2 =

Owing \$3 =

30° =

Two degrees below zero =

500 feet above sea level =

20 feet below sea level =

How do you know that these are not minus and plus signs? -3 and +5

What is the sign of a number that is not marked with a sign?

The absolute value of -7 =

The absolute value of +10 =

$|-5| =$

$|+5| =$

$|5| =$

$|12| =$

The opposite of -5 =

The opposite of +5 =

The opposite of 5 =

The opposite of 0 =

$- [- (+3)] =$

$- \{- [- (-3)]\} =$

$- [- (-3)] =$

$- \{- [- (+3)]\} =$

Positive and Negative Numbers Practice Problems

- **Integers, rational and irrational numbers, and real numbers**
- **Ordering positive and negative numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 136 - 139
e-book Pages 146 - 149

How can you tell if a number is an integer?

How can you tell if a number is a rational number?

How can you tell if a number is an irrational number?

How can you tell if a number is a real number?

Classify each of these numbers:

	Integer	Rational number	Irrational number	Real number
π				
$-\frac{1}{4}$				
+1				
$-2\frac{1}{4}$				
+2.7				
$-\sqrt{5}$				
0				
-5				
+.405				
$-\bar{3}$				

Write 0, -1,000,000, +2, -5, and -3 in ascending order.

Write $-\frac{1}{4}$, -11, $+\frac{1}{2}$, and -5 in ascending order.

Write -.02, -1.9, -3.5, and -.2 in ascending order.

Positive and Negative Numbers Practice Problems

- **Adding two signed numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 140 - 141
e-book Pages 150 - 151

$$+7 + +3 =$$

$$-7 + -3 =$$

$$+7 + -3 =$$

$$-3 + +7 =$$

$$-7 + +3 =$$

$$+3 + -7 =$$

$$7 + 3 =$$

$$7 + -3 =$$

$$-7 + 3 =$$

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

$$-\frac{3}{5} + +\frac{1}{5} =$$

$$+1.5 + -.3 =$$

$$-1.5 + -.3 =$$

Positive and Negative Numbers Practice Problems

- **Subtracting one signed number from another**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 142 - 143
e-book Pages 152 - 153

$$+7 - +3 =$$

$$-7 - -3 =$$

$$+7 - -3 =$$

$$-7 - +3 =$$

$$+3 - +7 =$$

$$-3 - -7 =$$

$$-3 - +7 =$$

$$+3 - -7 =$$

$$7 - 3 =$$

$$7 - -3 =$$

$$-7 - 3 =$$

$$-\frac{3}{5} - +\frac{1}{5} =$$

$$-\frac{3}{5} - -\frac{1}{5} =$$

$$+1.5 - +.3 =$$

$$+1.5 - -.3 =$$

Positive and Negative Numbers Practice Problems

- **Expert strategies for adding and subtracting signed numbers**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 144 - 145
e-book Pages 154 - 155

**Solve these problems by treating all signs as symbols
and replacing adjacent signs with a single + or –.**

$$+7 + +3 =$$

$$-7 + -3 =$$

$$+7 - +3 =$$

$$-7 - -3 =$$

$$+ 7 - -3 =$$

$$- 7 - +3 =$$

$$+7 + -3 =$$

$$-----3 =$$

$$----3 =$$

$$-----+9 =$$

$$-+9 =$$

$$- (+7) + [- (+3)] =$$

$$-7 + [- (-3)] =$$

Solve by grouping positive and negative numbers:

$$+1 + (-4) - (-2) -7 + (-3) =$$

Positive and Negative Numbers Practice Problems

▪ Multiplying signed numbers

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 146 - 148
e-book Pages 156 - 158

$$+5 \times (+6) =$$

$$^{-}3(+2)(^{-}10) =$$

$$^{-}5(^{-}6) =$$

$$+3(^{-}1)(^{-}2)(^{-}2) =$$

$$(^{-}5)(+6) =$$

$$^{-}\frac{1}{2} \times +\frac{3}{4} =$$

$$+5(^{-}6) =$$

$$^{-}\frac{1}{2} \times ^{-}\frac{3}{4} =$$

$$5 \times (+6) =$$

$$^{-}\frac{1}{2} \times ^{-}\frac{1}{2} \times ^{-}\frac{3}{4} =$$

$$(^{-}5)(6) =$$

$$5(^{-}6) =$$

$$^{-}1 \times +\frac{1}{2} =$$

$$(^{-}1)(+10) =$$

$$+1.5 \times +.3 =$$

$$^{-}1(^{-}10) =$$

$$^{-}1.5 \times ^{-}.3 =$$

$$+10 \times (^{-}1) =$$

$$^{-}2 \times +.2 \times ^{-}.3 =$$

$$^{-}10(^{-}1) =$$

$$^{-}1 \times ^{-}.5 =$$

Positive and Negative Numbers Practice Problems

- **Dividing one signed number by another**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 149 - 150
e-book Pages 159 - 160

$$+8 \div +2 =$$

$$-8 \div -2 =$$

$$-8 \div +2 =$$

$$+8 \div -2 =$$

$$8 \div -2 =$$

$$-8 \div 2 =$$

$$+8 \div -1 =$$

$$-8 \div -1 =$$

$$-\frac{1}{2} \div -\frac{3}{4} =$$

$$-\frac{1}{2} \div +\frac{3}{4} =$$

$$+\frac{1}{2} \div -1 =$$

$$+1.5 \div +.3 =$$

$$+1.5 \div -.3 =$$

$$-1.5 \div -1 =$$

Positive and Negative Numbers Practice Problems

- **Commutative, associative, and distributive properties of operations on signed numbers**
- **Order of operations**
- **Exponentials with negative bases**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 151 - 155
e-book Pages 161 - 165

Determine which property of operations is demonstrated by each example:

- commutative property
- associative property
- distributive property

$$+2(-3 + +4) = (+2 \times -3) + (+2 \times +4)$$

$$-2 \times -3 = -3 \times -2$$

$$-2 \times (+3 \times -4) = (-2 \times +3) \times -4$$

$$-2 + (-3 + +4) = (-2 + -3) + +4$$

$$-3(+5 - -2) = (-3 \times +5) - (-3 \times -2)$$

$$-5 + +2 = +2 + -5$$

$$(-3)^2 - (+1 + -1)^3 =$$

$$(-2)^4 =$$

$$-8 + -4 \times +21 - +12 \div -6 - +4 =$$

$$(-2)^5 =$$

$$+8 + -4(-21 - +12) \div +6 - +4 =$$

$$(-2)^7 \cdot (-2)^2 =$$

$$(-2)^1 =$$

$$(-2)^3 \div (-2) =$$

$$(-2)^2 =$$

$$(-2)^1 =$$

$$(-2)^3 =$$

$$(-2)^0 =$$

Positive and Negative Numbers Practice Problems

- **Exponentials with negative exponents**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 156 - 157
e-book Pages 166 - 167

Simplify:

$$\frac{2^2}{2^3} =$$

$$\frac{10^2}{10^5} =$$

$$\frac{5^1}{5^3} =$$

$$\frac{2^2}{2^3} =$$

$$\frac{10^2}{10^5} =$$

$$\frac{5^1}{5^3} =$$

$$2^{-4} \cdot (2)^3 =$$

$$10^5 \cdot 10^0 \cdot 10^1 \cdot 10^{-4} \cdot 10 =$$

$$(-3)^{-10} \cdot (-3)^{10} \cdot (-3)^1 =$$

$$16^{-6} \div 16^0 =$$

$$5^{-2} \cdot \frac{5^4}{5^1} =$$

$$(8^{34})^{-1} =$$

$$(10^0)^{-3} =$$

Positive and Negative Numbers Practice Problems

- **Multiplying and dividing by powers of 10 that have negative exponents**
 - **Using exponentials to identify place values**
 - **Scientific notation (for small numbers)**
-

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 158 - 160
e-book Pages 168 - 170

Find the value:

$$.3 \times (10)^{-3} =$$

$$.3 \times (10)^{-3} =$$

$$.3 \div (10)^{-3} =$$

$$.3 \div (10)^{-3} =$$

Fill in the place values as powers of 10:

1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Find the value:

$$2.9 \times 10^{-5}$$

$$7.025 \times 10^{-10}$$

Write .000000006031 in scientific notation.

Algebra

- **Algebraic expressions and equations**
- **Finding the value of an expression**
- **General guidelines for solving all equations**

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 161 - 163
e-book Pages 171 - 173

What is the difference between an algebraic expression and an algebraic equation?

In an algebraic expression or equation, how do you distinguish between constants and variables?

Write algebraically:

Five times x :

x times y :

Five times the sum of a and b :

Find the value of $x^2 + 2x - 7$

when $x = 4$

when $x = 10$

when $x = -1$

Solve and check the answer:

$$x + 3 = 24$$

$$24 = y - 39$$

$$4n = -36$$

$$\frac{x}{12} = 6$$

Algebra Practice Problems

- **Guidelines for solving equations that have several operations**

Page 1 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 164 - 166
e-book Pages 174 - 176

Solve and check the answer:

$$2x + 1 = 27$$

$$5n - 4 = 26$$

$$5 + \frac{x}{2} = 7$$

$$-10 + \frac{x}{2} = -4$$

$$-x = 24$$

$$-x + 2 = 24$$

$$4 - 8n = 28$$

$$-\frac{x}{2} = 4$$

$$\frac{6}{2n} = 24$$

$$\frac{24}{y} + 12 = 16$$

Algebra Practice Problems

- **Guidelines for solving equations that have several operations**

Page 2 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 167 - 169
e-book Pages 177 - 179

Solve and check the answer:

$$3(z - 2) = 24$$

$$\frac{2(x + 5)}{5} = 24$$

$$5(y + 9) = 24$$

$$4(x - 3) = -3$$

$$y + 2y - 70 = -10$$

$$2n = 3n + 5$$

$$3x + 2 = 2(x - 5)$$

$$2x + 4 = -12$$

$$x^2 + x = 5x$$

$$3(x + 1) = (x+1)(x - 1)$$

$$\frac{3x}{6} = 12$$

$$2(x + 4) = 6$$

Algebra Practice Problems

- **Solving a system of equations**
 - **Using algebra to solve percent problems**
 - **Multiplying monomials and polynomials**
-

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 170 - 172
e-book Pages 180 - 182

Solve and check the answer:

$$x + 2y = 300 \text{ AND } y = 10$$

$$5 - 2x + y = -6 \text{ AND } x + 3 = 5$$

Solve:

Find 25% of 80.

25% of what number is 20?

What percent of 80 is 20?

Identify the monomials and polynomials:

$$4x - 2a$$

$$3x$$

$$a^2y + 6$$

$$a^2y$$

$$a^2b^2c^2 + 3c^2$$

Simplify:

$$(a^2y)(3xy) =$$

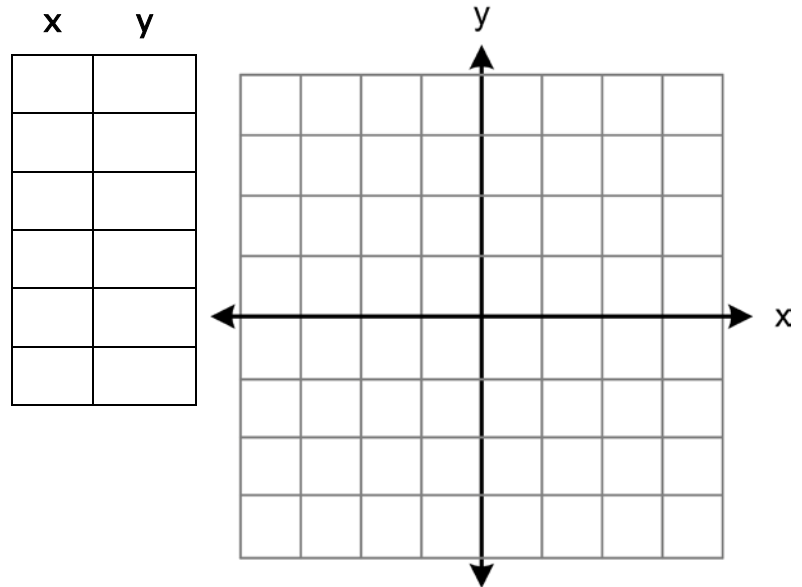
$$(x^2 + 3x + 7)(4x - 2) =$$

Algebra Practice Problems

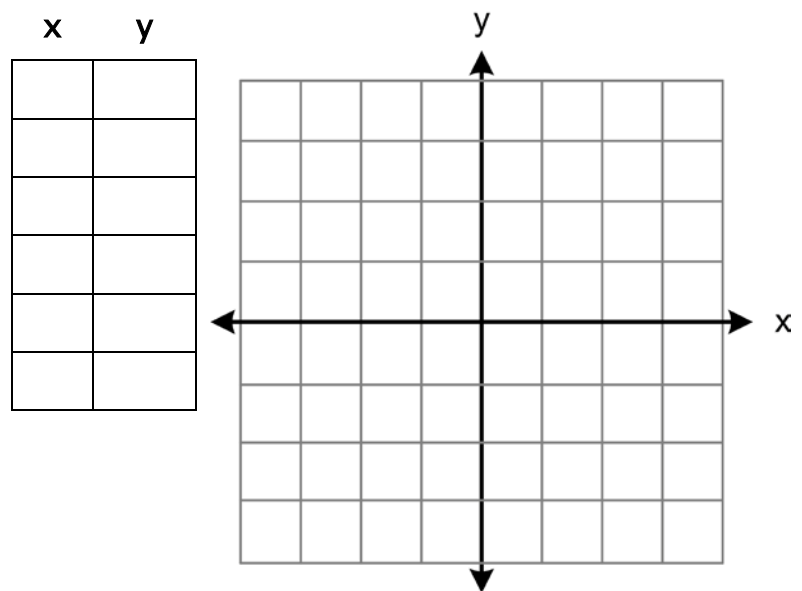
- Graphing on a coordinate grid

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 173 - 175
e-book Pages 183 - 185

Graph $y = 2x - 4$.



Graph $y = x^2 - x - 2$.



Algebra Practice Problems

▪ Formulas

Page 1 of 2

Solutions can be found in the
Basic Math Quick Reference
Handbook Pages 176 - 182
e-book Pages 186 - 192

Write formulas for the following geometric shapes

Circle formulas

Diameter

Circumference

Perimeter formulas

Rectangle

Square

Rhombus

Equilateral Triangle

Area formulas

Rectangle

Square

Parallelogram/Rhombus

Triangle

Circle

Volume formulas

Prism

Cube

Use the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to solve for the two roots of $y = x^2 - x - 2$.

Find the value of:

$$6! =$$

$$3! =$$

$$0! =$$

Use the formula ${}_n C_r = \frac{n!}{r!(n-r)!}$ to find ${}_4 C_3$.

Use the formula ${}_n P_r = \frac{n!}{(n-r)!}$ to find ${}_4 P_3$.

Use the formula $a_n = a_1 + (n - 1)d$ to find the 10th term in the sequence
7, 11, 15, 19, ...

Use the formula $a_n = a_1(r^{n-1})$ to find the 6th term in the sequence 3, 6, 12, 24, ...