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♥ Marie



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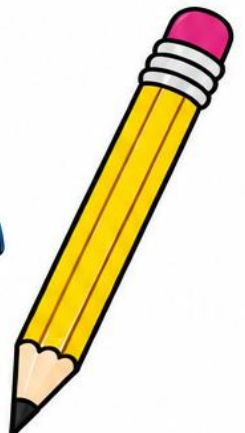




My

MATH

HELPER



≡ FRACTION STRIPS ≡

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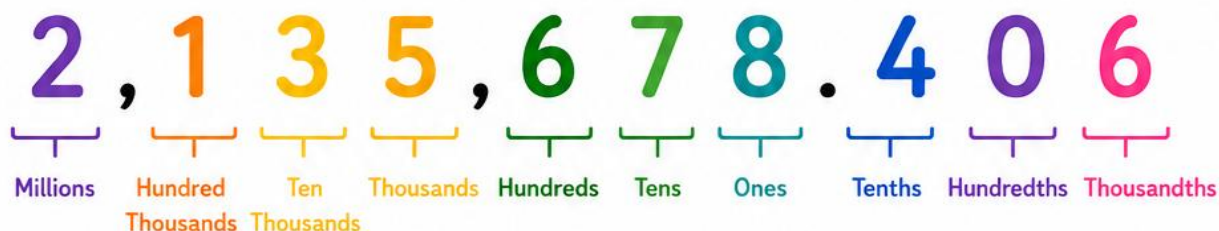
$\frac{1}{12}$

DECIMAL PLACE VALUE CHART

Understanding the value of each digit in a number.

WHOLE NUMBER PLACES							DECIMAL PLACES		
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1,000,000	100,000	10,000	1,000	100	10	1	0.1	0.01	0.001

EXAMPLE:



★ QUICK REMINDERS ★



MOVE LEFT

Each step left makes the value 10 times greater.

(Multiply by 10 for each step.)



MOVE RIGHT

Each step right makes the value 10 times smaller.

(Divide by 10 for each step.)



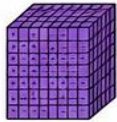
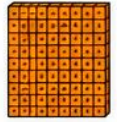
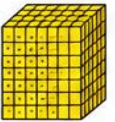
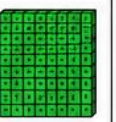
PLACEHOLDER

Zeros hold a place when a digit is missing.

★ Remember: Every digit has a place and a value! ★

DECIMAL PLACE VALUE CHART

Understanding the value of each digit in a number.

WHOLE NUMBER PLACES						DECIMAL PLACES			
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten Thousandths
100,000	10,000	1,000	100	10	1	0.1	0.01	0.001	0.0001
									
1 hundred thousand cube	1 ten thousand flat	1 thousand cube	1 hundred flat	1 ten rod	1 one unit	1 tenth rod	1 hundredth flat	1 thousandth unit	1 ten thousandth unit
10^5	10^4	10^3	10^2	10^1	10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}
0	0	5	8	7	3	4	2	6	0

EXAMPLE: 5,873.426

 Value gets 10 times greater as you move left.	$\times 10 \leftarrow$ $\rightarrow \div 10$	 Value gets 10 times smaller as you move right.
--	---	--

★ QUICK REMINDERS ★



MOVE LEFT

Each step left makes the value 10 times greater.

(Multiply by 10 for each step.)



MOVE RIGHT

Each step right makes the value 10 times smaller.

(Divide by 10 for each step.)

10^n POWERS OF TEN

Every place value is a power of 10.

Use exponents to show the value of each place.



PLACEHOLDER

Zeros hold a place when a digit is missing.

★ MORE REMINDERS ★

- ★ The decimal point separates whole numbers and decimal numbers.
- ★ Each place to the left is 10 times the value of the place to its right.
- ★ Each place to the right is $\frac{1}{10}$ (ten times smaller) the value of the place to its left.
- ★ You can add zeros as placeholders at the end of a number without changing its value.

Zeros at the End Do Not Change Value!

$$\begin{array}{l}
 4.5 = 4.50 = 4.500 = 4.5000 \\
 10 = 10.0 = 10.00 = 10.000 \\
 0.3 = 0.30 = 0.300 = 0.3000
 \end{array}$$

★ Remember: Every digit has a place and a value! ★

MULTIPLYING MULTI-DIGIT NUMBERS

Follow these steps every time!

1

SET IT UP.

Write the problem.
Line up the numbers
by place value.

H	T	O
3	4	7
×	2	6

EXAMPLE

$$347 \times 26$$

2

MULTIPLY BY THE ONES.

Multiply the bottom number
by the ones digit.
Write the answer
on the first line.
Regroup (carry) if needed.

$$\begin{array}{c} \times \\ 6 \end{array}$$

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{O} \\ 3 \quad 4 \quad 7 \\ \times \quad 2 \quad 6 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \quad 0 \quad 8 \quad 2 \quad \leftarrow 347 \times 6 \\ \text{(ones)} \end{array}$$

+

$$\begin{array}{r} 6 \quad 9 \quad 4 \quad 0 \quad \leftarrow 347 \times 20 \\ \text{(tens)} \end{array}$$

$$\begin{array}{r} 9 \quad 0 \quad 2 \quad 2 \quad \leftarrow \text{Final Answer} \end{array}$$

3

MULTIPLY BY THE TENS.

Multiply the bottom number
by the tens digit.
Write a 0 in the ones place
as a placeholder.
Write the answer
on the second line.
Regroup (carry) if needed.

$$\begin{array}{c} \times \\ 20 \end{array}$$

4

ADD THE PARTIAL PRODUCTS.

Add the two lines
of answers.

$$\begin{array}{c} + \end{array}$$

5

CHECK YOUR WORK.

Make sure your answer
makes sense.



REMEMBER!

- ★ Line up your numbers by place value.
- ★ Always start with the **ones place (right side)**.
- ★ Don't forget to **regroup (carry)** when needed!



≡ NUMBER FORMS ≡

The same number can be written in different ways.

PLACE VALUE REVIEW

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	•	Tenths	Hundredths	Thousandths
1,000,000	100,000	10,000	1,000	100	10	1	Decimal Point	0.1	0.01	0.001
3	4	2	7	5	6	8	.	9	3	1

The number above can be written in three different forms.

1. EXPANDED FORM

A way to show a number as the sum of the value of each digit.

Think:

Write each digit's value and add them together.

$$3,000,000 + 400,000 + 20,000 + 7,000 + 500 + 60 + 8 + 0.9 + 0.03 + 0.001$$

ANOTHER WAY TO WRITE IT:

$$3 \times 1,000,000 + 4 \times 100,000 + 2 \times 10,000 + 7 \times 1,000 + 5 \times 100 + 6 \times 10 + 8 \times 1 + 9 \times 0.1 + 3 \times 0.01 + 1 \times 0.001$$

2. STANDARD FORM

A way to write a number using digits.

Think:

Write the number normally.

3,427,568.931

3. WRITTEN FORM

A way to write a number using words.

Think:

Read the number and write it in words.

Three million, four hundred twenty-seven thousand, five hundred sixty-eight and nine hundred thirty-one thousandths

THE WORD "AND"

Use "and" to separate the whole number part from the decimal part.

Example: 27 and 5 hundredths

EXAMPLE: SEE THEM ALL TOGETHER!

EXPANDED FORM	STANDARD FORM	WRITTEN FORM
6,000 + 300 + 40 + 2 + 0.7 + 0.04	6,342.74	Six thousand, three hundred forty-two and seventy-four hundredths
50,000 + 2,000 + 70 + 3 + 0.09	52,073.09	Fifty-two thousand, seventy-three and nine hundredths
900,000 + 10,000 + 800 + 4 + 0.5 + 0.02 + 0.006	910,804.526	Nine hundred ten thousand, eight hundred four and five hundred twenty-six thousandths



Different forms, same number!



EXPONENTS

WHAT IS AN EXPONENT?

A small number that tells how many times to multiply a number by itself.

VOCABULARY

Base: The number that is being multiplied.



Exponent: The small number written above and to the right of the base.



Power: The result or value of the exponent expression.



PARTS OF AN EXPONENT

5³

Base = 5

This is the number being multiplied.

Exponent = 3

This tells how many times to multiply the base by itself.

Power = 125

This is the answer
($5 \times 5 \times 5 = 125$).

EXAMPLES

$$2^2 = 2 \times 2 = 4$$

$$3^3 = 3 \times 3 \times 3 = 27$$

$$4^2 = 4 \times 4 = 16$$

$$5^3 = 5 \times 5 \times 5 = 125$$

$$10^2 = 10 \times 10 = 100$$

$$10^3 = 10 \times 10 \times 10 = 1,000$$

POWERS OF TEN

$$10^0 = 1$$

$$10^1 = 10$$

$$10^2 = 100$$

$$10^3 = 1,000$$

$$10^4 = 10,000$$

$$10^5 = 100,000$$

$$10^6 = 1,000,000$$

IMPORTANT NOTES

★ Any non-zero number raised to the 0 power equals 1.

$$a^0 = 1 \quad (a \neq 0)$$

★ A larger exponent means a larger power.

$$2^4 = 16$$
$$2^5 = 32$$

★ Exponents show repeated multiplication.

$$6^3 \text{ means } 6 \times 6 \times 6$$

COMMON MISTAKES



Do NOT add the base and exponent.

$$2^3 \neq 2 + 3 = 5$$

$$2^3 = 2 \times 2 \times 2 = 8$$



Do NOT multiply the base and exponent.

$$3^2 \neq 3 \times 2 = 6$$

$$3^2 = 3 \times 3 = 9$$

REMEMBER:

An exponent tells how many times to multiply the base by itself.

≧ NUMBER FORMS ≦

The same number can be written in different ways.

The number 3,427,568.931 can be written in three different forms.

1. EXPANDED FORM

A way to show a number as the sum of the value of each digit.

Think:

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Different forms, same number!



LONG DIVISION

Divide • Multiply • Subtract • Bring Down

★ Follow these 4 steps every time! ★

1 DIVIDE

How many times does the divisor go into the first number?

$$\begin{array}{r} 4 \\ 5 \overline{) 23} \end{array}$$

5 goes into 23 four times.

Write the 4 above the dividend.

2 MULTIPLY

Multiply the quotient by the divisor.

$$\begin{array}{r} 4 \\ 5 \overline{) 23} \\ \underline{20} \end{array}$$

$$4 \times 5 = 20$$

Write the product under the dividend.

3 SUBTRACT

Subtract the product from the dividend.

$$\begin{array}{r} 4 \\ 5 \overline{) 23} \\ \underline{20} \\ 3 \end{array}$$

$$23 - 20 = 3$$

The remainder (3) is smaller than the divisor (5).

If it isn't, you made a mistake!

4 BRING DOWN

Bring down the next digit and repeat the steps.

$$\begin{array}{r} 4 \\ 5 \overline{) 237} \\ \underline{20} \\ 37 \end{array}$$

Bring down the 7 next to the 3 to make 37. Now repeat!

COMPLETE EXAMPLE

Divide 237 by 5 $\begin{array}{r} 4 \\ 5 \overline{) 23} \end{array}$ 5 goes into 23 four times.	4 × 5 = 20 $\begin{array}{r} 4 \\ 5 \overline{) 23} \\ \underline{20} \end{array}$	23 - 20 = 3 $\begin{array}{r} 4 \\ 5 \overline{) 23} \\ \underline{20} \\ 3 \end{array}$	Bring down 7 to make 37. $\begin{array}{r} 4 \\ 5 \overline{) 237} \\ \underline{20} \\ 37 \end{array}$	5 goes into 37 seven times. $\begin{array}{r} 7 \\ 5 \overline{) 237} \end{array}$	7 × 5 = 35 $\begin{array}{r} 47 \\ 5 \overline{) 237} \\ \underline{20} \\ 37 \end{array}$	37 - 35 = 2 $\begin{array}{r} 47 \\ 5 \overline{) 237} \\ \underline{20} \\ 37 \\ \underline{35} \\ 2 \end{array}$	Answer $\begin{array}{r} 47 \text{ R}2 \\ 5 \overline{) 237} \\ \underline{20} \\ 37 \\ \underline{35} \\ 2 \end{array}$ Remainder 2 is less than 5. You're done!
--	---	---	--	---	---	---	--

REMEMBER!

- ★ 1 Divide
- ★ 2 Multiply
- ★ 3 Subtract
- ★ 4 Bring Down

Then repeat until every digit has been used.

HELPFUL TIPS

- ✓ Check your work!
Quotient × Divisor + Remainder = Dividend
$$47 \times 5 + 2 = 237$$
- ✓ The remainder must always be **LESS THAN** the divisor.
- ✓ If the divisor does not go into a number, write 0 in the quotient and keep going.

WHEN I GET STUCK...

- 1 Can the divisor go into the number?
- 2 Multiply.
- 3 Subtract.
- 4 Bring down the next digit.
- 5 Repeat the steps!



★ Practice makes progress! ★

≡ ROUNDING & ESTIMATING ≡

Helpful Rules to Find Quick, Reasonable Answers

ROUNDING NUMBERS

Rounding gives the nearest number based on the place you choose.

PLACE	EXAMPLE NUMBER	LOOK AT THIS DIGIT	5 OR MORE ROUND UP	4 OR LESS KEEP IT THE SAME
ROUND TO THE NEAREST TEN →	6⑧	8	68 → 70	63 → 60
ROUND TO THE NEAREST HUNDRED →	4③2	3	432 → 400	487 → 500
ROUND TO THE NEAREST THOUSAND →	2⑦:89	7	2,789 → 3,000	2,432 → 2,000
ROUND TO THE NEAREST 10,000 →	⑤6,342	6	56,342 → 60,000	54,321 → 50,000

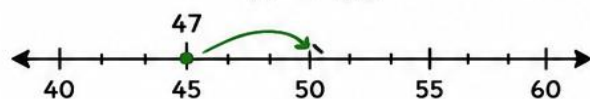
THE RULE:

- Look at the digit to the RIGHT of the place you are rounding to.
- If it is 5, 6, 7, 8, or 9 → round UP (add 1 to the place).
- If it is 0, 1, 2, 3, or 4 → keep the place the SAME.

ROUNDING ON A NUMBER LINE

ROUND TO THE NEAREST TEN

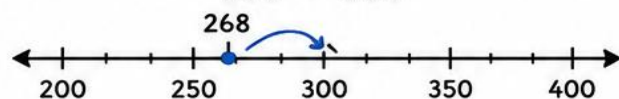
$$47 \approx 50$$



47 is closer to 50 than to 40.

ROUND TO THE NEAREST HUNDRED

$$268 \approx 300$$



268 is closer to 300 than to 200.

ESTIMATING

Estimating means finding a close answer that is easy to calculate in your head.

ESTIMATE BY ROUNDING EACH NUMBER

Example: $398 + 205$

Step 1: Round each number.

$$398 \approx 400 \quad 205 \approx 200$$

Step 2: Add the rounded numbers.

$$400 + 200 = 600$$

Step 3: The estimate is 600.

ESTIMATE BY COMPATIBLE NUMBERS

Example: $497 + 298$

Use numbers that are easy to add.

$$497 \approx 500 \quad 298 \approx 300$$

$$500 + 300 = 800$$

The estimate is 800.

ESTIMATE TO CHECK YOUR ANSWER

Example: $236 + 189 = 425$

Estimate: $236 \approx 200$

$$189 \approx 200$$

$$200 + 200 = 400$$

425 is close to 400.

Your answer is reasonable!

★ Estimating and rounding help you solve problems quickly and check your answers! ★

MATH SYMBOLS REFERENCE

Symbols are short ways to write math ideas.

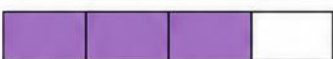
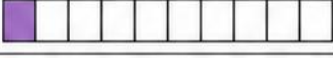
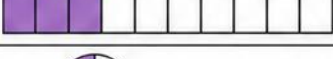
SYMBOL	NAME	MEANING	EXAMPLE
+	Addition	Add or plus	$7 + 5 = 12$
-	Subtraction	Take away or minus	$9 - 4 = 5$
x	Multiply	Times or multiplied by	$6 \times 3 = 18$
÷	Divide	Divided by	$20 \div 4 = 5$
=	Equals	The same as	$8 + 2 = 10$
≠	Not equal	Not the same as	$6 \neq 9$
<	Less than	Smaller than	$3 < 7$
>	Greater than	Larger than	$12 > 5$
≤	Less than or equal to	Smaller than or the same as	$5 \leq 5$ or $3 \leq 7$
≥	Greater than or equal to	Larger than or the same as	$9 \geq 9$ or $10 \geq 6$
≈	Approximately equal	Almost the same as; close in value	$3.14 \approx \pi$
π	Pi	The ratio of a circle's circumference to its diameter (about 3.14159)	$C = \pi d$
°	Degrees	Used to measure angles	90° is a right angle
√	Square root	A number that multiplied by itself equals the given number	$\sqrt{16} = 4$
%	Percent	Per hundred	$25\% = 25$ out of 100
()	Parentheses	Group numbers or operations together	$(3 + 4) \times 2 = 14$
	Absolute value	The distance of a number from zero (always positive or zero)	$ -7 = 7$ $ 3 = 3$



Remember: Symbols help us write math quickly and clearly!



FRACTION • DECIMAL • PERCENT CHART

FRACTION	DECIMAL	PERCENT
Part of a Whole	Decimal Form	Out of 100
$\frac{1}{1}$ 	1.0	100%
$\frac{1}{2}$ 	0.5	50%
$\frac{1}{4}$ 	0.25	25%
$\frac{3}{4}$ 	0.75	75%
$\frac{1}{5}$ 	0.2	20%
$\frac{2}{5}$ 	0.4	40%
$\frac{4}{5}$ 	0.6	60%
$\frac{4}{10}$ 	0.8	80%
$\frac{1}{10}$ 	0.1	10%
$\frac{3}{10}$ 	0.3	30%
$\frac{1}{3}$ 	$0.\overline{33}$	$33\frac{1}{3}\%$
$\frac{2}{3}$ 	$0.\overline{66}$	$66\frac{2}{3}\%$
$\frac{1}{8}$ 	0.125	12.5%
$\frac{3}{8}$ 	0.375	37.5%
$\frac{5}{8}$ 	0.625	62.5%
$\frac{7}{8}$ 	0.875	87.5%

★ QUICK REMINDERS ★

- To write a percent: move the decimal 2 places to the right and add %.
- To write a decimal: move the decimal 2 places to the left and remove %.
- To write a fraction from a decimal: write the decimal as a fraction and simplify.
- The percent sign (%) means "out of 100."



★ EXAMPLES ★

$$0.75 = 75\% = \frac{3}{4}$$

$$25\% = 0.25 = \frac{1}{4}$$

$$0.6 = 60\% = \frac{3}{5}$$

GEOMETRY FORMULAS

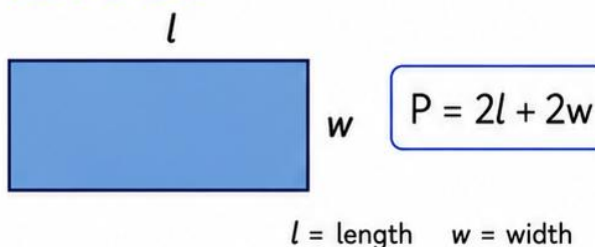
SIMPLIFIED

Quick formulas to help you find perimeter and area.

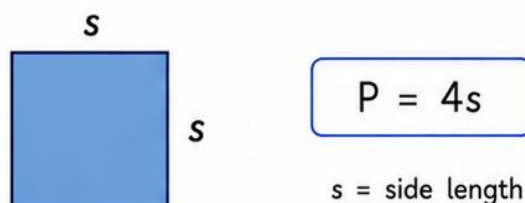
PERIMETER

The distance around a shape.

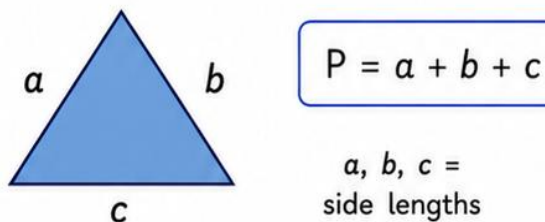
RECTANGLE



SQUARE



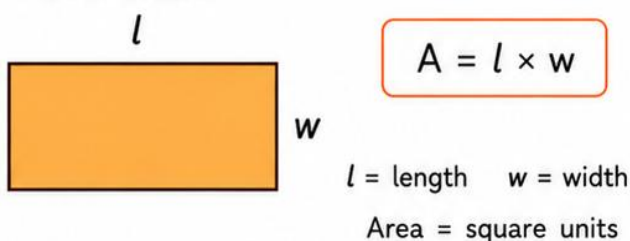
TRIANGLE



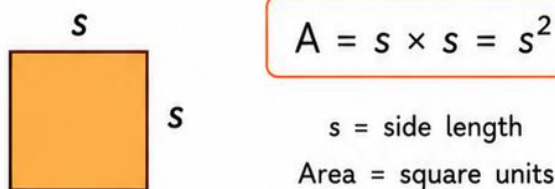
AREA

The space inside a shape.

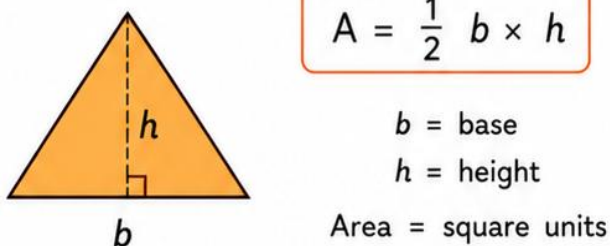
RECTANGLE



SQUARE

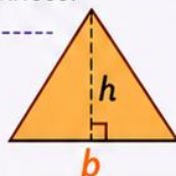


TRIANGLE



★ **2D SHAPE** = a flat shape that has length and width, but no thickness.

REMEMBER: b = base (the bottom length)
 h = height (the vertical distance)



Use the right formula for the right shape!



LINES & ANGLES

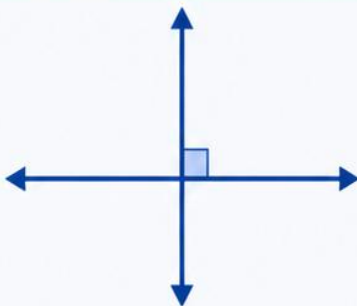
A guide to important types of lines and parts of lines and angles.

PARALLEL LINES



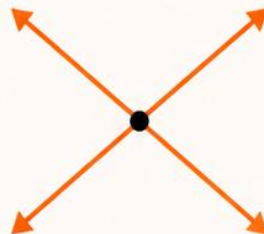
Two lines in the same plane that never intersect and stay the same distance apart.

PERPENDICULAR LINES



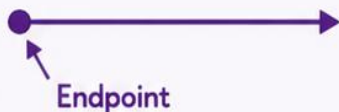
Two lines that intersect to form a right angle (90°).

INTERSECTING LINES



Two lines that intersect at one point.
(Not a right angle.)

RAY



A part of a line that starts at an endpoint and extends forever in one direction.

LINE



A straight path that extends forever in both directions.
(Arrows on both ends.)

LINE SEGMENT



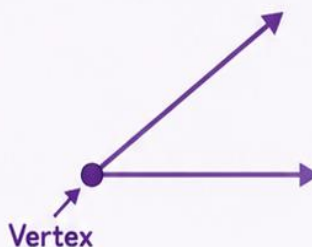
A part of a line that has two endpoints and a set length.

ENDPOINT



The point at the end of a line segment or the starting point of a ray.

VERTEX



The common endpoint of two rays that form an angle.



Use these words and ideas to describe and understand lines and angles!



MULTIPLYING MULTI-DIGIT NUMBERS

Follow these steps every time!

1

SET IT UP.

Write the problem.
Line up the numbers
by place value.

H	T	O
3	4	7
$\times$	2	6

EXAMPLE

$$347 \times 26$$

2

MULTIPLY BY THE ONES.

Multiply the bottom number
by the ones digit.
Write the answer
on the first line.
Regroup (carry) if needed.

$$\begin{array}{c} \times \\ 6 \end{array}$$

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{O} \\ 3 \quad 4 \quad 7 \\ \times \quad 2 \quad 6 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \quad 0 \quad 8 \quad 2 \quad \leftarrow 347 \times 6 \\ \text{(ones)} \end{array}$$

+

$$\begin{array}{r} 6 \quad 9 \quad 4 \quad 0 \quad \leftarrow 347 \times 20 \\ \text{(tens)} \end{array}$$

$$\begin{array}{r} 9 \quad 0 \quad 2 \quad 2 \quad \leftarrow \text{Final Answer} \end{array}$$

3

MULTIPLY BY THE TENS.

Multiply the bottom number
by the tens digit.
Write a 0 in the ones place
as a placeholder.
Write the answer
on the second line.
Regroup (carry) if needed.

$$\begin{array}{c} \times \\ 20 \end{array}$$

4

ADD THE PARTIAL PRODUCTS.

Add the two lines
of answers.

$$\begin{array}{c} + \end{array}$$

5

CHECK YOUR WORK.

Make sure your answer
makes sense.



REMEMBER!

- ★ Line up your numbers by place value.
- ★ Always start with the **ones place (right side)**.
- ★ Don't forget to **regroup (carry)** when needed!



FRACTION OPERATIONS

Use these rules and steps to solve fraction problems.

1 ADD & SUBTRACT FRACTIONS

SAME DENOMINATOR

Add or subtract the numerators.
Keep the denominator.

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

DIFFERENT DENOMINATORS

Find the Least Common Denominator (LCD) first.

$$\frac{1}{2} + \frac{1}{4} \rightarrow \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

STEPS:

1. Find the Least Common Denominator (LCD).
2. Rename each fraction using the LCD.
3. Add or subtract the numerators.
4. Simplify if needed.

2 MULTIPLY FRACTIONS

Multiply the numerators.
Multiply the denominators.

$$\frac{3}{2} \times \frac{5}{4} = \frac{3 \times 5}{2 \times 4} = \frac{15}{8}$$

CROSS-CANCEL (SIMPLIFY BEFORE MULTIPLYING)

Cross-cancel common factors.

$$\frac{2}{\cancel{3}_1} \times \frac{\overset{1}{\cancel{3}}}{7} = \frac{2 \times 1}{1 \times 7} = \frac{2}{7}$$

★ Tip: Cross-cancel common factors in numerator and denominator.

3 DIVIDE FRACTIONS

Use **Keep • Change • Flip**

KEEP

the first fraction.

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

CHANGE

the division to multiplication.

$$\div \rightarrow \times$$

FLIP

the second fraction.

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

$$\frac{3}{4} \div \frac{2}{5} = \frac{3}{4} \times \frac{5}{2} = \frac{15}{8} = 1 \frac{7}{8}$$

★ Tip: Dividing by a fraction is the same as multiplying by its reciprocal (flip it!).

4 MIXED NUMBERS

MIXED → IMPROPER

$$\begin{array}{r} 2 \frac{1}{3} \\ \downarrow \\ 2 \times 3 = 6 \\ \downarrow \\ 6 + 1 = 7 \\ \downarrow \\ \frac{7}{3} \end{array}$$

IMPROPER → MIXED

$$\begin{array}{r} \frac{11}{4} \\ \downarrow \\ 11 \div 4 = 2 \text{ R}3 \\ \downarrow \\ 2 \frac{3}{4} \end{array}$$

ALWAYS REMEMBER

- ★ Simplify whenever possible.
- ★ Find the LCD before adding or subtracting.
- ★ Cross-cancel before multiplying.
- ★ Keep • Change • Flip when dividing.

BEFORE YOU FINISH...



Can you simplify?

Is your answer a mixed number if needed?

Does your answer make sense?

MEAN, MEDIAN, MODE, RANGE

Four Important Ways to Describe a Set of Numbers

A TINY CHART

MEAN = Average Add all the numbers and divide.	MEDIAN = Middle Put the numbers in order and find the middle.	MODE = Most The number that occurs the most.	RANGE = Biggest – Smallest How far apart the numbers are.
---	--	---	--

TERM	WHAT IT MEANS	HOW TO FIND IT	EXAMPLE
MEAN Average	The mean is the average of all the numbers.	1. Add all the numbers. 2. Divide by how many numbers there are.	Numbers: 3, 5, 7, 9, 11 $3 + 5 + 7 + 9 + 11 = 35$ $35 \div 5 = 7$ Mean = 7
MEDIAN Middle	The median is the middle number when the numbers are in order.	1. Put the numbers in order from least to greatest. 2. Find the middle number. • If there are an even number of values, average the two middle numbers.	Numbers: 3, 5, 7, 9, 11 3, 5, 7(9), 11 Median = 7
MODE Most	The mode is the number that occurs the most .	1. Count how many times each number appears. 2. The number(s) that appear the most is the mode.	Numbers: 2, 4, 4, 4, 6, 8 4 appears 3 times 2 appears 1 time 6 appears 1 time 8 appears 1 time Mode = 4
RANGE Biggest – Smallest	The range tells how far apart the biggest and smallest numbers are.	1. Find the biggest number. 2. Find the smallest number. 3. Subtract: Biggest – Smallest	Numbers: 3, 5, 7, 9, 11 Biggest = 11 Smallest = 3 $11 - 3 = 8$ Range = 8

QUICK REMEMBER!

MEAN
Average



Add all the numbers and divide.

MEDIAN
Middle



Order the numbers and find the middle.

MODE
Most



The number that occurs the most.

RANGE
Biggest – Smallest



How far apart the numbers are.

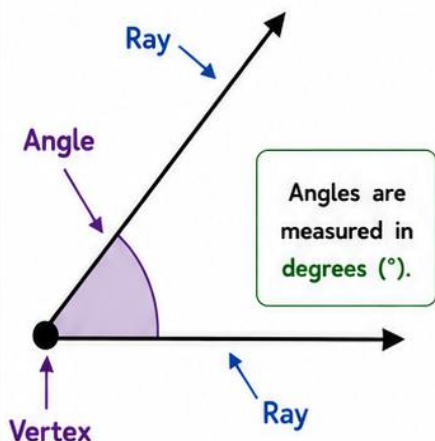


TIP: Practice with different sets of numbers to become faster and more confident!

≡ ANGLES ≡

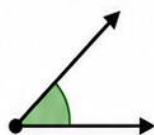
An angle is formed by two rays that share a common endpoint called the **vertex**.

PARTS OF AN ANGLE



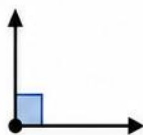
TYPES OF ANGLES

ACUTE ANGLE



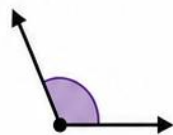
Less than 90°

RIGHT ANGLE



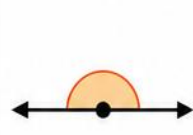
Exactly 90°

OBTUSE ANGLE



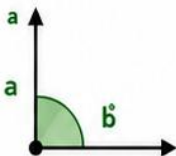
Greater than 90°
and less than 180°

STRAIGHT ANGLE



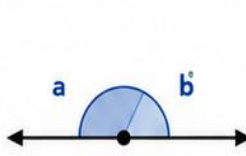
Exactly 180°

COMPLEMENTARY ANGLES



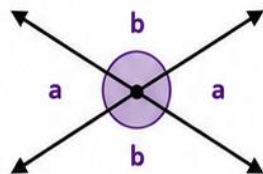
$$a + b = 90^\circ$$

SUPPLEMENTARY ANGLES



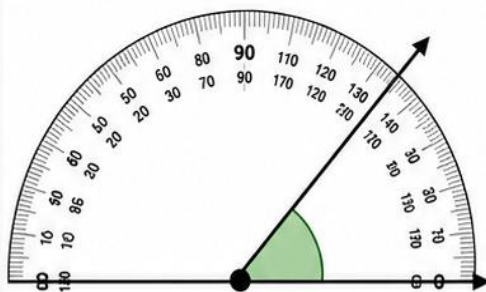
$$a + b = 180^\circ$$

VERTICAL ANGLES



$$a = a \text{ and } b = b$$

MEASURING ANGLES



1 CENTER

Place the center of the protractor on the vertex.

2 LINE UP

Line up one ray with the 0° line.

3 READ

Read the degree measure where the other ray points.

ANGLE BENCHMARKS

Acute Angle	less than 90°
Right Angle	exactly 90°
Obtuse Angle	greater than 90° and less than 180°
Straight Angle	exactly 180°

★ REMEMBER ★

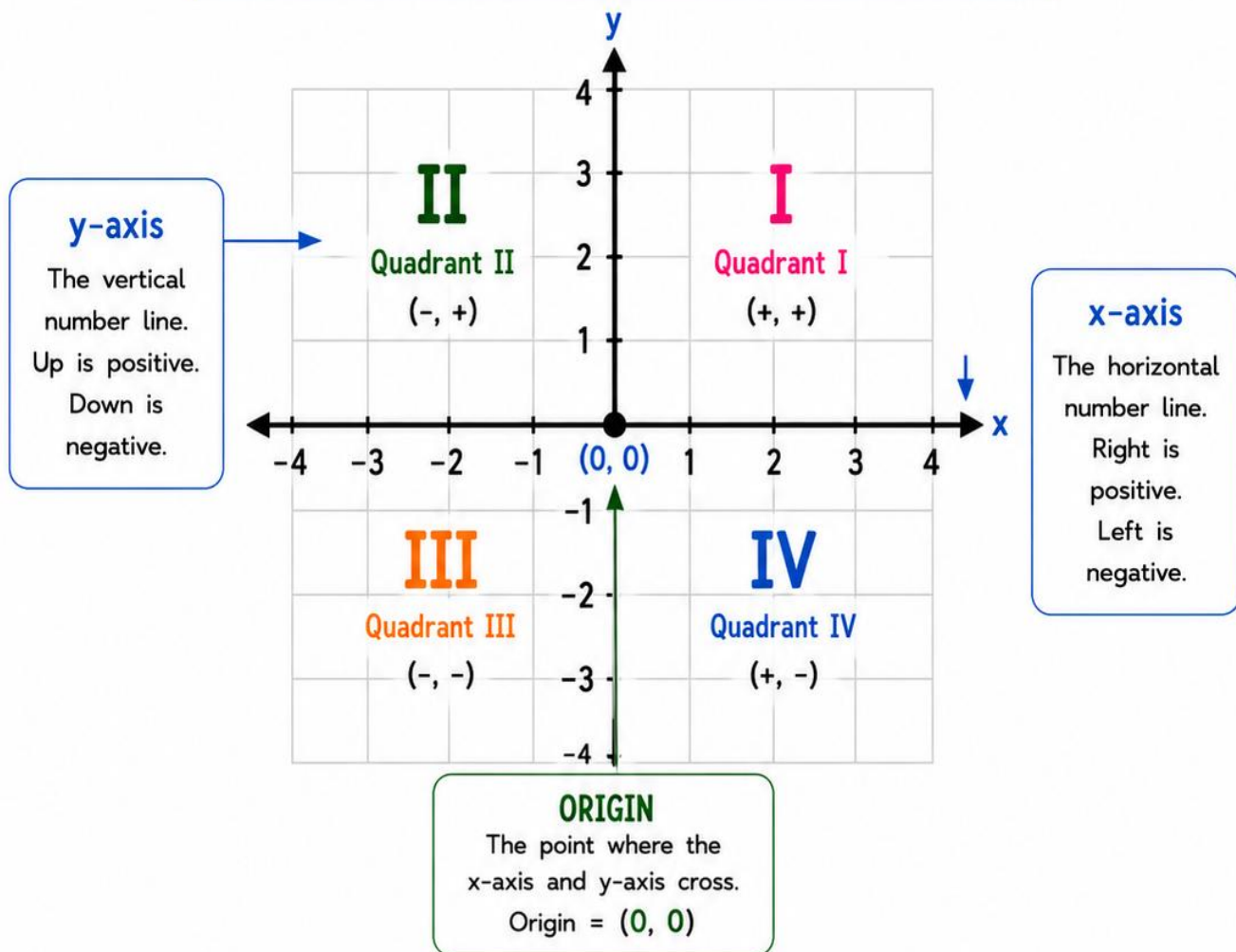
• Angles measure turn, not length.

• Angles are measured in degrees (°).

• A larger angle does not mean longer sides.

COORDINATE PLANE

A grid of numbers used to locate points.



ORDERED PAIRS

(x, y)

Move x first (left or right) Move y second (up or down)

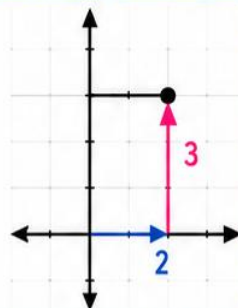
An ordered pair (x, y) tells you how to locate a point on the coordinate plane.

1. Start at the origin $(0, 0)$.
2. Move x units left or right.
3. Then move y units up or down.
4. Plot the point.

EXAMPLE:

Plot $(2, 3)$

- Right 2
- Up 3
- Point at $(2, 3)$



TIP: Signs tell the direction.

$(+, +)$ = Right and Up

$(-, +)$ = Left and Up

$(-, -)$ = Left and Down

$(+, -)$ = Right and Down

METRIC LADDER

A quick reference for metric conversions



LENGTH

kilometer (km)	hectometer (hm)	dekameter (dam)	meter (m)	decimeter (dm)	centimeter (cm)	millimeter (mm)
1,000	100	10	1	0.1	0.01	0.001



Move the decimal left one place for each step.
(Divide by 10 for each step.)

Meter is the base unit.



Move the decimal right one place for each step.
(Multiply by 10 for each step.)



MASS

kilogram (kg)	hectogram (hg)	dekagram (dag)	gram (g)	decigram (dg)	centigram (cg)	milligram (mg)
1,000	100	10	1	0.1	0.01	0.001



Move the decimal left one place for each step.
(Divide by 10 for each step.)

Gram is the base unit.



Move the decimal right one place for each step.
(Multiply by 10 for each step.)



VOLUME / CAPACITY

kiloliter (kL)	hectoliter (hL)	dekaliter (daL)	liter (L)	deciliter (dL)	centiliter (cL)	milliliter (mL)
1,000	100	10	1	0.1	0.01	0.001



Move the decimal left one place for each step.
(Divide by 10 for each step.)

Liter is the base unit.



Move the decimal right one place for each step.
(Multiply by 10 for each step.)

★ QUICK REMINDERS ★

- Each step is 10 times larger or 10 times smaller.
- Move the decimal the same way you move on the ladder.
- Use zeros as placeholders if needed.
- All metric measurements are based on powers of 10.



★ EXAMPLES ★

LENGTH: Convert 3.5 km to meters.

3.5 km → move 3 steps right → $3.5 \times 1,000 = 3,500$ m

MASS: Convert 250 g to kilograms.

250 g → move 3 steps left → $250 \div 1,000 = 0.25$ kg

VOLUME: Convert 0.75 L to milliliters.

0.75 L → move 3 steps right → $0.75 \times 1,000 = 750$ mL

★ Remember: Larger units ← → Smaller units ★

EXPONENTS

WHAT IS AN EXPONENT?

A small number that tells how many times to multiply a number by itself.

VOCABULARY

Base: The number that is being multiplied.



Exponent: The small number written above and to the right of the base.



Power: The result or value of the exponent expression.



PARTS OF AN EXPONENT

5³

Base = 5

This is the number being multiplied.

Exponent = 3

This tells how many times to multiply the base by itself.

Power = 125

This is the answer
($5 \times 5 \times 5 = 125$).

EXAMPLES

$$2^2 = 2 \times 2 = 4$$

$$3^3 = 3 \times 3 \times 3 = 27$$

$$4^2 = 4 \times 4 = 16$$

$$5^3 = 5 \times 5 \times 5 = 125$$

$$10^2 = 10 \times 10 = 100$$

$$10^3 = 10 \times 10 \times 10 = 1,000$$

POWERS OF TEN

10^0	= 1
10^1	= 10
10^2	= 100
10^3	= 1,000
10^4	= 10,000
10^5	= 100,000
10^6	= 1,000,000

IMPORTANT NOTES

★ Any non-zero number raised to the 0 power equals 1.

$$a^0 = 1 \quad (a \neq 0)$$

★ A larger exponent means a larger power.

$$2^4 = 16$$
$$2^5 = 32$$

★ Exponents show repeated multiplication.

$$6^3 \text{ means } 6 \times 6 \times 6$$

COMMON MISTAKES



Do NOT add the base and exponent.

$$2^3 \neq 2 + 3 = 5$$
$$2^3 = 2 \times 2 \times 2 = 8$$



Do NOT multiply the base and exponent.

$$3^2 \neq 3 \times 2 = 6$$
$$3^2 = 3 \times 3 = 9$$

REMEMBER:



An exponent tells how many times to multiply the base by itself.



ORDER OF OPERATIONS

PEMDAS

Follow this order to simplify expressions.

P PARENTHESES	()	Do all operations inside parentheses first.	Example: $3 + (8 - 4) \times 2$ $= 3 + 4 \times 2$
E EXPONENTS	a^2	Evaluate all exponents next.	Example: $3 + 4 \times \underline{2^2}$ $= 3 + 4 \times 4$
M MULTIPLY	$\times$	Multiply from left to right.	Example: $3 + \underline{4 \times 4} - 6$ $= 3 + 16 - 6$
D DIVIDE	$\div$	Divide from left to right.	Example: $3 + \underline{16 \div 2} - 6$ $= 3 + 8 - 6$
A ADD	$+$	Add from left to right.	Example: $\underline{3 + 8} - 6$ $= 11 - 6$
S SUBTRACT	$-$	Subtract from left to right.	Example: $\underline{11 - 6}$ $= 5$

REMEMBER



If you see only addition and subtraction, or only multiplication and division, always work from **LEFT TO RIGHT**.

Full Example:

$$\begin{aligned}
 &2 + 3 \times (6 - 2)^2 \div 2 \\
 &= 2 + 3 \times (4)^2 \div 2 \\
 &= 2 + 3 \times 16 \div 2 \\
 &= 2 + 48 \div 2 \\
 &= 2 + 24 \\
 &= 26
 \end{aligned}$$

- $\rightarrow$ Parentheses
- $\rightarrow$ Exponents
- $\rightarrow$ Multiply
- $\rightarrow$ Divide
- $\rightarrow$ Add
- $\rightarrow$ Subtract

MATH WORDS TO KNOW

WORD	DEFINITION	SYMBOL / IMAGE
Factor	A number that divides another number evenly.	$a \times b = c$
Multiple	A product of a number and a whole number.	$a, 2a, 3a, 4a, \dots$
Product	The answer to a multiplication problem.	$a \times b$
Quotient	The answer to a division problem.	$a \div b$
Prime	A whole number greater than 1 that has exactly two factors: 1 and itself.	2, 3, 5, 7, 11, ...
Composite	A whole number greater than 1 that has more than two factors.	4, 6, 8, 9, 10, ...
Equivalent	Equal in value.	$\frac{1}{2} = \frac{2}{4}$
Numerator	The top number in a fraction; tells how many equal parts are being counted.	$\frac{a}{b}$ ← numerator
Denominator	The bottom number in a fraction; tells how many equal parts make up the whole.	$\frac{a}{b}$ ← denominator
Decimal	A number written using a decimal point.	2.75
Percent	A number or ratio expressed as a fraction of 100.	75%
Perimeter	The distance around the outside of a 2-dimensional shape.	
Area	The amount of space inside a 2-dimensional shape.	
Volume	The amount of space inside a 3-dimensional object.	
Radius	A line segment from the center of a circle to any point on the circle.	
Diameter	A line segment that passes through the center of a circle and has endpoints on the circle.	
Circumference	The distance around a circle.	

MATH VOCABULARY

Important words to know and use!

FACTOR

A number that is multiplied by another number to get a product.

Example: The factors of 12 are 1, 2, 3, 4, 6, 12.



MULTIPLE

A number that is the product of a given number and any whole number.

Example: 12, 24, 36, 48 are multiples of 12.



PRODUCT

The answer you get when you multiply numbers.

Example: $6 \times 7 = 42$

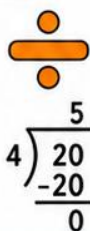
$$6 \times 7 = 42$$



QUOTIENT

The answer you get when you divide one number by another.

Example: $20 \div 4 = 5$



SUM

The answer you get when you add numbers.

Example: $14 + 8 = 22$

$$14 + 8 = 22$$



DIFFERENCE

The answer you get when you subtract one number from another.

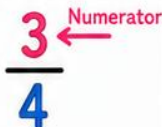
Example: $15 - 6 = 9$

$$15 - 6 = 9$$



NUMERATOR

The top number of a fraction. It tells how many equal parts you have.



DENOMINATOR

The bottom number of a fraction. It tells how many equal parts make a whole.



EQUIVALENT

Fractions, decimals, or percents that have the same value.

$$\frac{1}{2} = \frac{2}{4} = 0.5 = 50\%$$

PRIME

A whole number greater than 1 that has exactly two factors: 1 and itself.

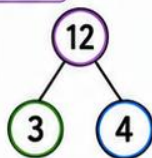
Example: 2, 3, 5, 7, 11



COMPOSITE

A whole number greater than 1 that has more than two factors.

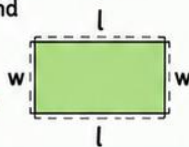
Example: 4, 6, 8, 9, 10



PERIMETER

The distance around the outside of a 2-D shape.

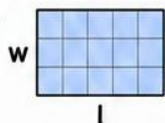
Example: Rectangle
 $P = 2l + 2w$



AREA

The amount of space inside a 2-D shape.

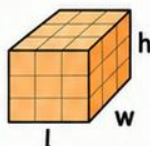
Example: Rectangle
 $A = l \times w$



VOLUME

The amount of space inside a 3-D shape.

Example: Rectangular Prism
 $V = l \times w \times h$



ESTIMATE

An approximate answer that is reasonable.

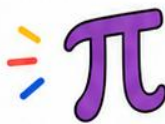
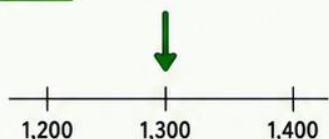
Example: $398 + 215$
 $\approx 400 + 200 = 600$



ROUND

To change a number to a friendlier or easier number that is close to the original.

Example: 1,257 rounded to the nearest hundred = 1,300





ROMAN NUMERALS



Ancient symbols used to write numbers.

ROMAN NUMERAL KEY

I	V	X	L	C	D	M
1	5	10	50	100	500	1,000

RULES TO REMEMBER

- When a smaller numeral is **BEFORE** a larger numeral, you **SUBTRACT**.
- When a smaller numeral is **AFTER** a larger numeral, you **ADD**.

EXAMPLES

I	=	1	
II	=	2	
III	=	3	
IV	=	4	(5 - 1)
V	=	5	
VI	=	6	(5 + 1)
IX	=	9	(10 - 1)

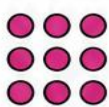
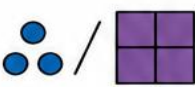
X	=	10	
XV	=	15	(10 + 5)
XL	=	40	(50 - 10)
L	=	50	
XC	=	90	(100 - 10)
C	=	100	
CD	=	400	(500 - 100)
D	=	500	
M	=	1,000	



Use the key, the rules, and practice!

≡ DIVISIBILITY RULES ≡

Use these rules to quickly check if a number is divisible by another number.

DIVISIBLE BY	RULE	EXAMPLE
2  (even)	The number ends in 0, 2, 4, 6, or 8.	Yes: 4, 126, 8,890 No: 7, 135, 2,897
3 	The sum of the digits is a multiple of 3.	Yes: 36 (3+6=9) No: 28 (2+8=10)
4 	The last two digits form a number that is divisible by 4.	Yes: 2,316 (16 ÷ 4) No: 2,358 (58 ÷ 4)
5 	The number ends in 0 or 5.	Yes: 45, 170, 2,005 No: 42, 1,378, 3,261
6 	The number is divisible by both 2 and 3.	Yes: 48, 126, 2,736 No: 34, 105, 1,925
9 	The sum of the digits is a multiple of 9.	Yes: 81 (8+1=9) No: 64 (6+4=10)
10	The number ends in 0.	Yes: 30, 450, 7,890 No: 32, 1,050, 5,863
12 	The number is divisible by both 3 and 4.	Yes: 144, 372, 2,604 No: 24, 108, 2,502

REMEMBER



If a number is divisible by a rule above, it is **ALSO** divisible by all of that number's factors!

EXAMPLES:

- If a number is divisible by 6, it is also divisible by 2 and 3.
- If a number is divisible by 12, it is also divisible by 2, 3, 4, and 6.

PLANE FIGURES CHART

A plane figure is a flat (2-dimensional) shape.

TRIANGLE



3 sides
3 vertices

SQUARE



4 sides
4 vertices

RECTANGLE



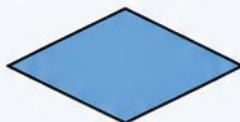
4 sides
4 vertices

TRAPEZOID



4 sides
4 vertices

RHOMBUS



4 sides
4 vertices

PARALLELOGRAM



4 sides
4 vertices

PENTAGON



5 sides
5 vertices

HEXAGON



6 sides
6 vertices

OCTAGON



8 sides
8 vertices

CIRCLE



No straight sides
0 vertices

★ A circle is round and has no sides or vertices.

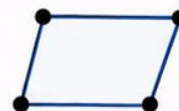
★ Vertices are the points where sides meet.

QUICK REMEMBER



★ **POLYGON**
A closed figure with straight sides.

★ **QUADRILATERAL**
A 4-sided polygon.



● Triangle ● Quadrilaterals (4-sided shapes) ● Polygons (5 or more sides) ● Circle

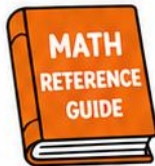
WHEN I GET STUCK...

Good problem solvers don't give up. They try different strategies!

BEFORE ASKING...

☐ Read the problem again. 

☐ Underline what you are solving. 

☐ Look in your Math Reference Guide. 

☐ Find a similar example. 

☐ Try your best. 

☐ Ask a partner. 

☐ Then ask the teacher. 

★ Be patient. Be persistent. ★
You can do it!

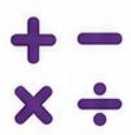
SOLVE WORD PROBLEMS

Use this checklist every time!

1 Read carefully.
Read the problem all the way through. 

2 Underline important information.
Find numbers and key words. 

3 Circle the question.
What are you being asked to find? 

4 Choose the operation.
Decide if you add, subtract, multiply, or divide. 

5 Solve.
Show your work neatly. 

6 Check your answer.
Does it make sense?
Estimate or use another way to check. 

7 Label your answer.
Write a complete sentence with units if needed. 

★ GOOD THINKERS FOLLOW STEPS AND DON'T GIVE UP! ★
You've got this!

PRIME NUMBERS, FACTORS & MULTIPLES

PRIME NUMBERS 1-100

A **prime number** is a whole number greater than 1 that has exactly two factors: 1 and itself.

2 3 5 7 11 13 17 19
23 29 31 37 41 43 47 53
59 61 67 71 73 79 83 89
97

★ 1 is **NOT** a prime number.
It has only one factor: 1.

FACTORS

Factors are numbers that divide evenly into another number.

Example: Factors of 36

$$\begin{array}{ll} 36 \div 1 = 36 & 36 \div 9 = 4 \\ 36 \div 2 = 18 & 36 \div 12 = 3 \\ 36 \div 3 = 12 & 36 \div 18 = 2 \\ 36 \div 4 = 9 & 36 \div 36 = 1 \\ 36 \div 6 = 6 & \end{array}$$

Factors of 36:
1, 2, 3, 4, 6, 9, 12, 18, 36

QUICK FACTS

★ Every whole number has at least two factors: 1 and itself.

★ Prime numbers have exactly two factors: 1 and itself.

★ Composite numbers have more than two factors.

MULTIPLES

Multiples are the products of a number and the counting numbers (1, 2, 3, ...). They are found by skipping counting numbers.

NUMBER	FIRST 10 MULTIPLES	EXAMPLE
2	2, 4, 6, 8, 10, 12, 14, 16, 18, 20	$2 \times 6 = 12$
3	3, 6, 9, 12, 15, 18, 21, 24, 27, 30	$3 \times 6 = 18$
4	4, 8, 12, 16, 20, 24, 28, 32, 36, 40	$4 \times 6 = 24$
5	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	$5 \times 6 = 30$
6	6, 12, 18, 24, 30, 36, 42, 48, 54, 60	$6 \times 6 = 36$
9	9, 18, 27, 36, 45, 54, 63, 72, 81, 90	$9 \times 6 = 54$
10	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	$10 \times 6 = 60$



Look for patterns!

- Even numbers are multiples of 2.
- Numbers ending in 0 or 5 are multiples of 5.



If a number is a multiple of two numbers, it is a multiple of their least common multiple (LCM).

CUSTOMARY CONVERSIONS

Common U.S. Customary Measurements

LENGTH

1 foot (ft)	=	12 inches (in)
1 yard (yd)	=	3 feet (ft)
1 yard (yd)	=	36 inches (in)
1 mile (mi)	=	1,760 yards (yd)
1 mile (mi)	=	5,280 feet (ft)
1 mile (mi)	=	63,360 inches (in)

WEIGHT (MASS)

16 ounces (oz)	=	1 pound (lb)
1 pound (lb)	=	16 ounces (oz)
1 ton (T)	=	2,000 pounds (lb)



Remember:

Smaller to larger = multiply

Larger to smaller = divide

CAPACITY (LIQUID)

1 gallon (gal)	=	4 quarts (qt)	1 pint (pt)	=	2 cups (c)
1 gallon (gal)	=	8 pints (pt)	1 pint (pt)	=	16 fluid ounces (fl oz)
1 gallon (gal)	=	16 cups (c)	1 cup (c)	=	8 fluid ounces (fl oz)
1 gallon (gal)	=	128 fluid ounces (fl oz)	1 fluid ounce (fl oz)	=	1 tablespoon (tbsp)
1 quart (qt)	=	2 pints (pt)	1 tablespoon (tbsp)	=	3 teaspoons (tsp)
1 quart (qt)	=	4 cups (c)	1 teaspoon (tsp)	=	$\frac{1}{3}$ tablespoon (tbsp)
1 quart (qt)	=	32 fluid ounces (fl oz)			

CAPACITY (DRY)

1 peck (pk)	=	4 bushels (bu)	1 quart (qt)	=	2 pints (pt)
1 bushel (bu)	=	4 pecks (pk)	1 quart (qt)	=	4 cups (c)
1 bushel (bu)	=	8 quarts (qt)	1 pint (pt)	=	2 cups (c)
1 bushel (bu)	=	32 pints (pt)	1 cup (c)	=	16 tablespoons (tbsp)
1 bushel (bu)	=	64 cups (c)	1 cup (c)	=	48 teaspoons (tsp)

OTHER USEFUL CONVERSIONS

1 dozen	=	12	1 hour	=	60 minutes
1 gross	=	144 (12 dozen)	1 minute	=	60 seconds
1 score	=	20	1 foot	=	0.3048 meters
1 week	=	7 days	1 yard	=	0.9144 meters
1 year	=	365 days	1 mile	=	1.60934 kilometers
1 leap year	=	366 days			

★ Check your work and use units every time! ★



Multiplication Chart

**1**

$1 \times 0 = 0$
 $1 \times 1 = 1$
 $1 \times 2 = 2$
 $1 \times 3 = 3$
 $1 \times 4 = 4$
 $1 \times 5 = 5$
 $1 \times 6 = 6$
 $1 \times 7 = 7$
 $1 \times 8 = 8$
 $1 \times 9 = 9$
 $1 \times 10 = 10$
 $1 \times 11 = 11$
 $1 \times 12 = 12$

2

$2 \times 0 = 0$
 $2 \times 1 = 2$
 $2 \times 2 = 4$
 $2 \times 3 = 6$
 $2 \times 4 = 8$
 $2 \times 5 = 10$
 $2 \times 6 = 12$
 $2 \times 7 = 14$
 $2 \times 8 = 16$
 $2 \times 9 = 18$
 $2 \times 10 = 20$
 $2 \times 11 = 22$
 $2 \times 12 = 24$

3

$3 \times 0 = 0$
 $3 \times 1 = 3$
 $3 \times 2 = 6$
 $3 \times 3 = 9$
 $3 \times 4 = 12$
 $3 \times 5 = 15$
 $3 \times 6 = 18$
 $3 \times 7 = 21$
 $3 \times 8 = 24$
 $3 \times 9 = 27$
 $3 \times 10 = 30$
 $3 \times 11 = 33$
 $3 \times 12 = 36$

4

$4 \times 0 = 0$
 $4 \times 1 = 4$
 $4 \times 2 = 8$
 $4 \times 3 = 12$
 $4 \times 4 = 16$
 $4 \times 5 = 20$
 $4 \times 6 = 24$
 $4 \times 7 = 28$
 $4 \times 8 = 32$
 $4 \times 9 = 36$
 $4 \times 10 = 40$
 $4 \times 11 = 44$
 $4 \times 12 = 48$

5

$5 \times 0 = 0$
 $5 \times 1 = 5$
 $5 \times 2 = 10$
 $5 \times 3 = 15$
 $5 \times 4 = 20$
 $5 \times 5 = 25$
 $5 \times 6 = 30$
 $5 \times 7 = 35$
 $5 \times 8 = 40$
 $5 \times 9 = 45$
 $5 \times 10 = 50$
 $5 \times 11 = 55$
 $5 \times 12 = 60$

6

$6 \times 0 = 0$
 $6 \times 1 = 6$
 $6 \times 2 = 12$
 $6 \times 3 = 18$
 $6 \times 4 = 24$
 $6 \times 5 = 30$
 $6 \times 6 = 36$
 $6 \times 7 = 42$
 $6 \times 8 = 48$
 $6 \times 9 = 54$
 $6 \times 10 = 60$
 $6 \times 11 = 66$
 $6 \times 12 = 72$

7

$7 \times 0 = 0$
 $7 \times 1 = 7$
 $7 \times 2 = 14$
 $7 \times 3 = 21$
 $7 \times 4 = 28$
 $7 \times 5 = 35$
 $7 \times 6 = 42$
 $7 \times 7 = 49$
 $7 \times 8 = 56$
 $7 \times 9 = 63$
 $7 \times 10 = 70$
 $7 \times 11 = 77$
 $7 \times 12 = 84$

8

$8 \times 0 = 0$
 $8 \times 1 = 8$
 $8 \times 2 = 16$
 $8 \times 3 = 24$
 $8 \times 4 = 32$
 $8 \times 5 = 40$
 $8 \times 6 = 48$
 $8 \times 7 = 56$
 $8 \times 8 = 64$
 $8 \times 9 = 72$
 $8 \times 10 = 80$
 $8 \times 11 = 88$
 $8 \times 12 = 96$

9

$9 \times 0 = 0$
 $9 \times 1 = 9$
 $9 \times 2 = 18$
 $9 \times 3 = 27$
 $9 \times 4 = 36$
 $9 \times 5 = 45$
 $9 \times 6 = 54$
 $9 \times 7 = 63$
 $9 \times 8 = 72$
 $9 \times 9 = 81$
 $9 \times 10 = 90$
 $9 \times 11 = 99$
 $9 \times 12 = 108$

10

$10 \times 0 = 0$
 $10 \times 1 = 10$
 $10 \times 2 = 20$
 $10 \times 3 = 30$
 $10 \times 4 = 40$
 $10 \times 5 = 50$
 $10 \times 6 = 60$
 $10 \times 7 = 70$
 $10 \times 8 = 80$
 $10 \times 9 = 90$
 $10 \times 10 = 100$
 $10 \times 11 = 110$
 $10 \times 12 = 120$

11

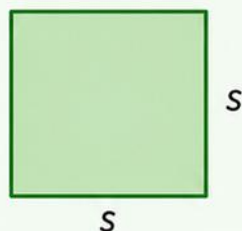
$11 \times 0 = 0$
 $11 \times 1 = 11$
 $11 \times 2 = 22$
 $11 \times 3 = 33$
 $11 \times 4 = 44$
 $11 \times 5 = 55$
 $11 \times 6 = 66$
 $11 \times 7 = 77$
 $11 \times 8 = 88$
 $11 \times 9 = 99$
 $11 \times 10 = 110$
 $11 \times 11 = 121$
 $11 \times 12 = 132$

12

$12 \times 0 = 0$
 $12 \times 1 = 12$
 $12 \times 2 = 24$
 $12 \times 3 = 36$
 $12 \times 4 = 48$
 $12 \times 5 = 60$
 $12 \times 6 = 72$
 $12 \times 7 = 84$
 $12 \times 8 = 96$
 $12 \times 9 = 108$
 $12 \times 10 = 120$
 $12 \times 11 = 132$
 $12 \times 12 = 144$

≧ PERIMETER & AREA ≦

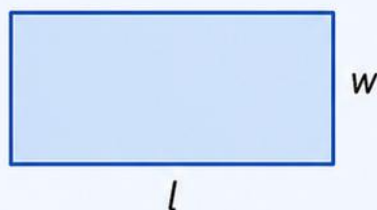
SQUARE



Perimeter: $P = 4s$

Area: $A = s^2$

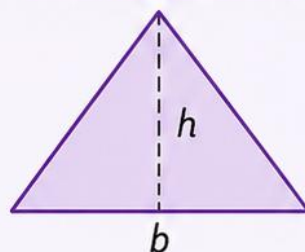
RECTANGLE



Perimeter: $P = 2(l + w)$

Area: $A = lw$

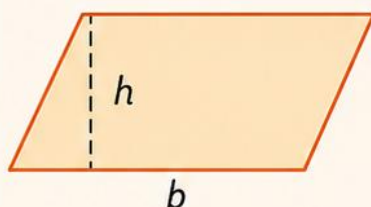
TRIANGLE



Perimeter: $P = a + b + c$

Area: $A = \frac{1}{2}bh$

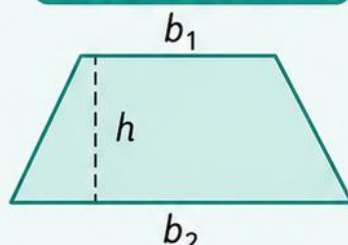
PARALLELOGRAM



Perimeter: $P = 2(a + b)$

Area: $A = bh$

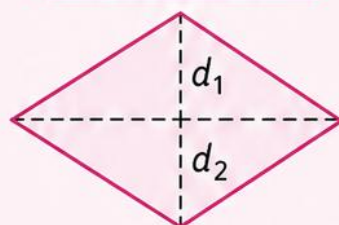
TRAPEZOID



Perimeter: $P = a + b_1 + b_2 + c$

Area: $A = \frac{1}{2}(b_1 + b_2)h$

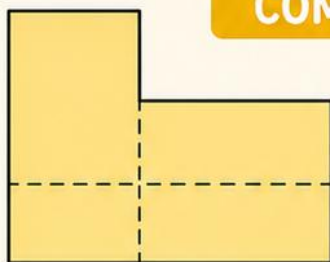
RHOMBUS



Perimeter: $P = 4s$

Area: $A = \frac{1}{2}d_1d_2$

COMPOSITE FIGURES

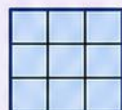


Divide the figure into simpler shapes. Find the area of each part and add them together.

REMEMBER



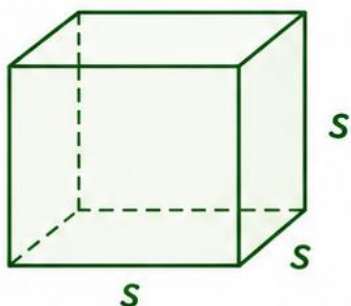
Perimeter = distance around



Area = space inside

≡ VOLUME & SURFACE AREA ≡

CUBE

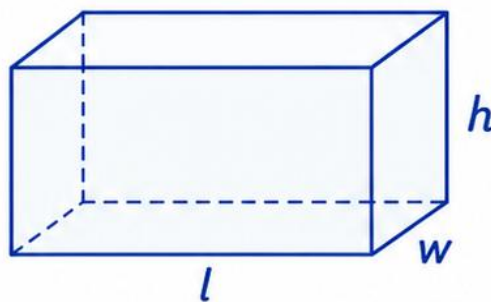


Volume: $V = s^3$

Surface Area:

$SA = 6s^2$

RECTANGULAR PRISM

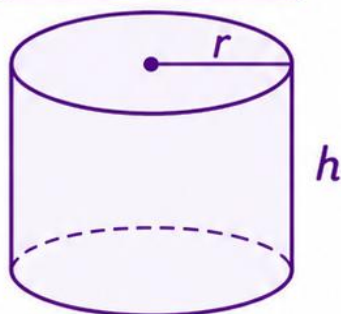


Volume: $V = lwh$

Surface Area:

$SA = 2(lw + lh + wh)$

CYLINDER

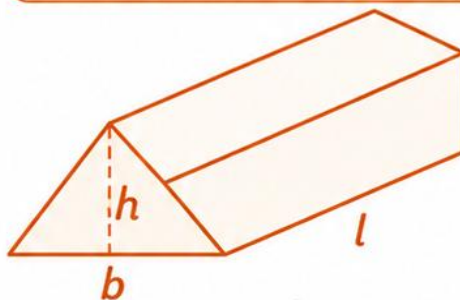


Volume: $V = \pi r^2 h$

Surface Area:

$SA = 2\pi r^2 + 2\pi rh$

TRIANGULAR PRISM



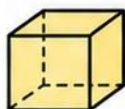
Volume: $V = \left(\frac{1}{2}bh\right)l$

Surface Area:

$SA = (bh + lp) + 2\left(\frac{1}{2}bh\right)$

p = perimeter of
triangular base

REMEMBER



Volume = cubic units

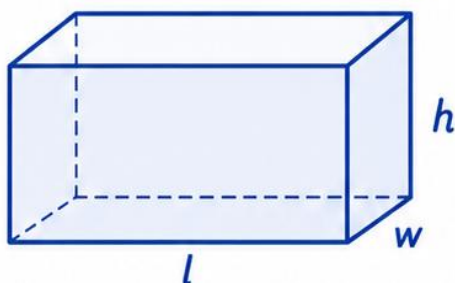


Surface Area = square units

VOLUME & SURFACE AREA

Formulas for rectangular prisms and cubes.

RECTANGULAR PRISM



Volume: $V = l \times w \times h$

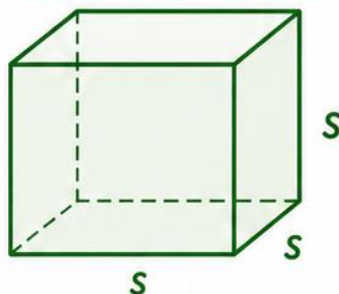
Surface Area:

$$SA = 2(lw + lh + wh)$$



Find the area of each face.
Add all 6 faces together.

CUBE



Volume: $V = s^3$

Surface Area:

$$SA = 6s^2$$

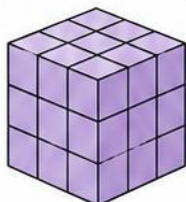


A cube is a special rectangular prism where all edges are the same length.

WHAT DO THESE MEAN?

Volume =

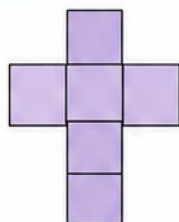
the amount of space inside a 3D shape.



Measured in
CUBIC UNITS (units^3)

Surface Area =

the total area of all the faces on the outside.



Measured in
SQUARE UNITS (units^2)

Think:



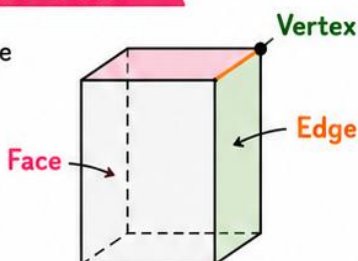
Couples to find volume.



Count squares to find surface area.

KEY VOCABULARY

- **Face** – a flat surface
- **Edge** – where two faces meet
- **Vertex** – a corner (where edges meet)



UNITS REMEMBER!



Area = square units
(units^2)



Volume = cubic units
(units^3)

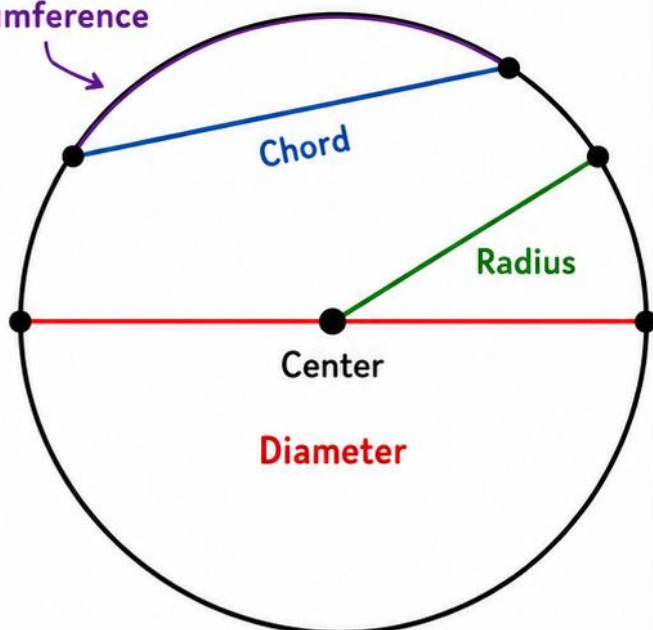


Use the correct formula and plug in the given values carefully!



≡ CIRCLE REFERENCE ≡

Circumference



Center: the exact middle point of the circle.

Radius (r): a line segment from the center of the circle to any point on the circle.

Diameter (d): a line segment that passes through the center of the circle and has endpoints on the circle.

Chord: a line segment with endpoints on the circle.

Circumference (C): the distance around the circle.

RADIUS ↔ DIAMETER RELATIONSHIP

$$d = 2r$$

$$r = d \div 2$$

CIRCUMFERENCE

Formula:

$$C = 2\pi r \text{ or } C = \pi d$$

where π (pi) ≈ 3.14

The circumference is the distance around the circle.

AREA

Formula:

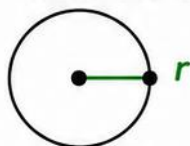
$$A = \pi r^2$$

where π (pi) ≈ 3.14

The area is the space inside the circle.

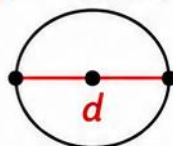
REMEMBER

Radius = from the center



It only goes halfway.

Diameter = all the way across



It goes through the center.

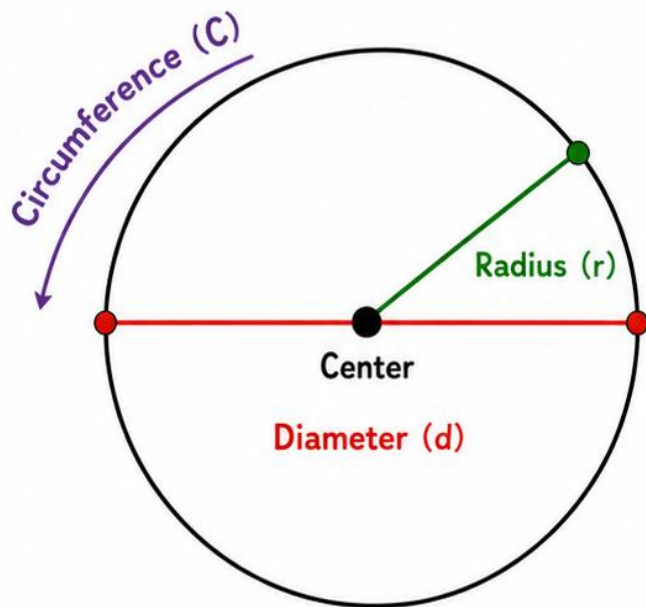


Use the formula that matches the shape and what you are asked to find!



CIRCLE REFERENCE

Key parts, definitions, and formulas



KEY DEFINITIONS

- Center** = the exact middle point of the circle.
- Radius (r)** = a line segment from the center of the circle to any point on the circle.
- Diameter (d)** = a line segment that passes through the center of the circle and has endpoints on the circle.
- Circumference (C)** = the distance around the circle.

RADIUS AND DIAMETER RELATIONSHIP

$$d = 2r$$

$$r = d \div 2$$

CIRCUMFERENCE

Formula:

$$C = 2\pi r \text{ or } C = \pi d$$

where π (pi) ≈ 3.14

The circumference is the distance around the circle.

AREA

Formula:

$$A = \pi r^2$$

where π (pi) ≈ 3.14

The area is the space inside the circle.

QUICK FACTS

- ★ Radius is half the diameter.
- ★ Diameter is twice the radius.
- ★ Circumference is the distance around.
- ★ Area is the space inside.
- ★ Use $\pi \approx 3.14$.
- ★ All radii of a circle are the same length.

★ Use the correct formula and plug in the given values carefully! ★



ODD AND EVEN NUMBERS



Numbers can be **ODD** or **EVEN**.

EVEN NUMBERS

Even numbers can be divided by **2** with no remainder.

2 EVEN NUMBERS
END IN:

0, 2, 4, 6, 8

Examples:

0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

ODD NUMBERS

Odd numbers leave a remainder of 1 when divided by **2**.

1 ODD NUMBERS
END IN:

1, 3, 5, 7, 9

Examples:

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21

WAYS TO TELL

EVEN NUMBERS

- ★ End in 0, 2, 4, 6, or 8.
- ★ Can be divided by 2 with no remainder.
- ★ Skip count by 2s to get to all even numbers.

ODD NUMBERS

- ★ End in 1, 3, 5, 7, or 9.
- ★ Leave a remainder of 1 when divided by 2.
- ★ Skip count by 2s to get to all odd numbers.

SKIP COUNTING

Skip counting by 2s helps you find even and odd numbers quickly!

**EVEN
NUMBERS**

0 2 4 6 8 10 12 14 14 16 18 20

**ODD
NUMBERS**

1 3 5 7 9 11 11 13 15 17 19 21

COUNTING MONEY

Add the value of each coin or bill.

U.S. COINS

PENNY



1¢

one cent

NICKEL



5¢

five cents

DIME



10¢

ten cents

QUARTER



25¢

twenty-five cents

HALF DOLLAR



50¢

fifty cents

DOLLAR COIN



\$1.00

one dollar

U.S. BILLS

\$1



one dollar

\$5



five dollars

\$10



ten dollars

\$20



twenty dollars

\$50



fifty dollars

HOW TO COUNT MONEY

1

SORT IT.

Separate your money by coins and bills.



2

COUNT EACH GROUP.

Count how many of each coin or bill you have.

Quarters	×	3	=	75¢
Dimes	×	4	=	40¢
Nickels	×	2	=	10¢
Pennies	×	5	=	5¢
\$1 Bills	×	2	=	\$2.00

3

FIND THE VALUE.

Multiply the number of each coin or bill by its value.



4

ADD THE TOTAL.

Add all the values together to find the total amount.

75¢
+ 40¢
+ 10¢
+ 5¢
+ \$2.00
\$3.30

5

CHECK YOUR ANSWER.

Make sure your total makes sense.



EXAMPLE



Step 1: Sort and count.

Quarters	×	3	=	75¢
Dimes	×	4	=	40¢
Nickels	×	2	=	10¢
Pennies	×	5	=	5¢
\$1 Bills	×	2	=	\$2.00

Step 2: Add the values.

$$75¢ + 40¢ + 10¢ + 5¢ + \$2.00 = \$3.30$$

Total Amount: \$3.30



Helpful Tips!

- ★ Start with the largest bills and coins.
- ★ Use tallies to keep track if needed.

- ★ Double-check your work!

≡ IT ALL ADDS UP! ≡

Different coins and bills can equal the same amount.

TEN
TEN DOLLAR
BILLS



EQUALS



ONE HUNDRED
DOLLAR BILL

TEN
ONES



EQUALS



TEN
DOLLARS

TEN
DIMES



EQUALS



ONE DOLLAR

TEN
PENNIES



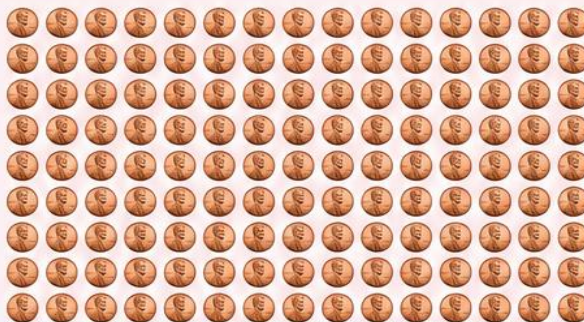
EQUALS



ONE DIME

BONUS!

ONE
HUNDRED
PENNIES

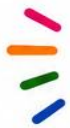


EQUALS



ONE DOLLAR

☆☆☆ ≡ **LEARN IT. COUNT IT. USE IT!** ≡ ☆☆☆



TELLING TIME



Time helps us plan our day!

PARTS OF A CLOCK

HOUR HAND

The **short** hand shows the **hour**. It points to a number.

MINUTE HAND

The **long** hand shows the **minutes**. It points to the numbers or tick marks.

NUMBERED 1-12

These show the **HOURS**.

TICK MARKS

These show the **MINUTES**.

There are 60 minutes in 1 hour.
60 minutes = 1 hour

TIME VOCABULARY

O'CLOCK

The minute hand points to 12.



3:00

three o'clock

QUARTER PAST

The minute hand points to 3.



4:15

quarter past four

HALF PAST

The minute hand points to 6.



6:30

half past six

QUARTER TO

The minute hand points to 9.



7:45

quarter to eight

MINUTES TO

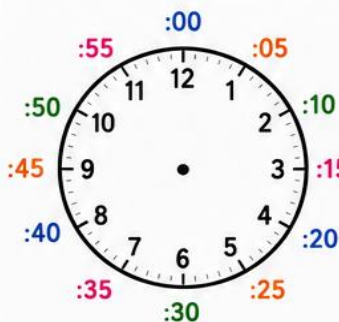
The minute hand is between the numbers. Count up to the next hour.



8:50

ten minutes to nine

COUNTING TIME BY FIVES



Say it this way:

:00 - o'clock
:05 - five past
:10 - ten past
:15 - quarter past
:20 - twenty past
:25 - twenty-five past
:30 - half past
:35 - twenty-five to
:40 - twenty to
:45 - quarter to
:50 - ten to
:55 - five to

ELAPSED TIME (TIME INTERVALS)

Elapsed time is the amount of time that passes from the start time to the end time.

Start Time



2:15

End Time



3:00

Elapsed Time

45
minutes

It took **45** minutes.

Count forward in 5-minute jumps

+5
2:15 2:20 2:25 2:30 2:35 2:40 2:45 2:50 2:55 3:00

There are 45 minutes from 2:15 to 3:00.

DIGITAL TIME

Digital clocks show time with numbers.



- The first number is the HOUR.
- The last two numbers are the MINUTES.
- Use AM (morning) or PM (afternoon/evening).

HOURS AND MINUTES REFERENCE CHART

HOUR (O'CLOCK)	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00
QUARTER PAST	1:15	2:15	3:15	4:15	5:15	6:15	7:15	8:15	9:15	10:15	11:15	12:15
HALF PAST	1:30	2:30	3:30	4:30	5:30	6:30	7:30	8:30	9:30	10:30	11:30	12:30
QUARTER TO	1:45	2:45	3:45	4:45	5:45	6:45	7:45	8:45	9:45	10:45	11:45	12:45



HELPFUL TIPS!

- ★ The long hand (minutes) moves FAST.
- ★ The short hand (hours) moves SLOW.

- ★ Start with the minutes.
- ★ Practice every day!

