

GED Math Graphics:
Illustrated Guide to Self-Confidence
www.gedmathgraphics.net

Top 10 Charts

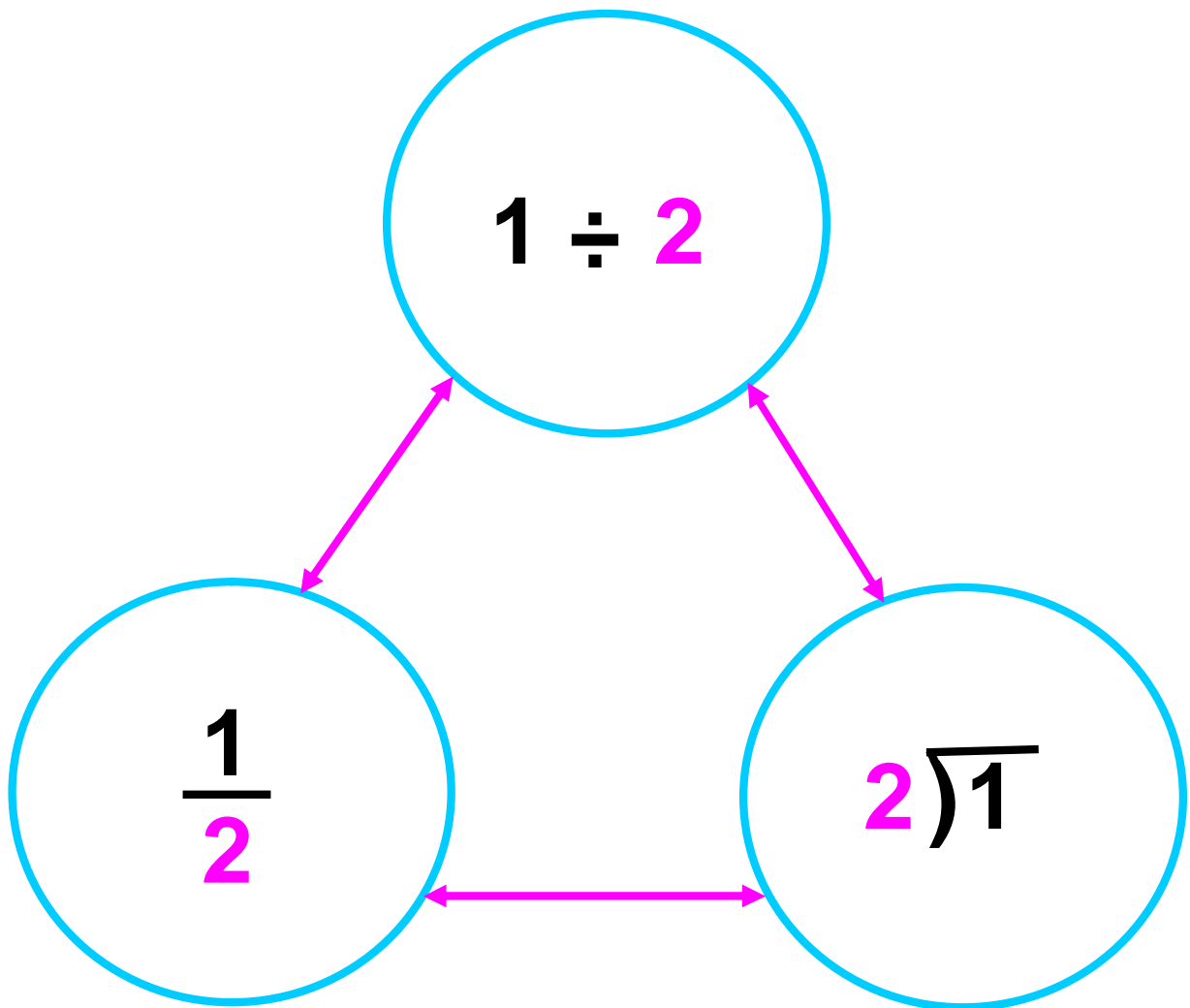
Recommended Uses:

- Download a set for each student.
- Use this file for a black-only printer.
- Have each student make a booklet, fill in colors with highlighters.
- Post color versions on 9"x12" cardboard cut-outs.
- Or better yet, have students draw large color posters (engaging!).
- Review as required during active learning sessions.
- Capture "teachable moments" in real time.

by Howard Myers, Ed.D.

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To Divide



10, 100, 1000 . . .

Move point right, one place per zero.

To Multiply



$$1\ 2.\ 3\ 4 \times 10 = 1\ 2.\ 3\ 4$$

$$1\ 2.\ 3\ 4 \times 100 = 1\ 2.\ 3\ 4$$

$$1\ 2.\ 3\ 4 \times 1000 = 1\ 2.\ 3\ 4\ 0$$

Zero "place holder."

Move point left, one place per zero.

To Divide



$$1\ 2.\ 3\ 4 \div 10 = 1.\ 2\ 3\ 4$$

$$1\ 2.\ 3\ 4 \div 100 = 0.\ 1\ 2\ 3\ 4$$

$$1\ 2.\ 3\ 4 \div 1000 = 0.\ 0\ 1\ 2\ 3\ 4$$

Zero "place holder."

To Multiply Fractions

Cancel Common Factors

$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

$$\frac{1}{\cancel{2}} \times \frac{\cancel{4} \times 2}{5} = \frac{2}{5}$$

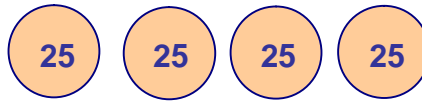
$$\frac{\cancel{2}}{\cancel{3}} \times \frac{\cancel{9}}{\cancel{10}} = \frac{3}{5}$$

$5 \times \cancel{2}$

GED Skill – Cancel with Coin Factors

You know these – Now use them!

Quarters



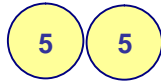
$$25 \times 4 = 100$$

Dimes

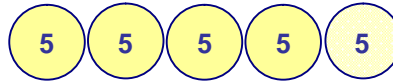


$$10 \times 10 = 100$$

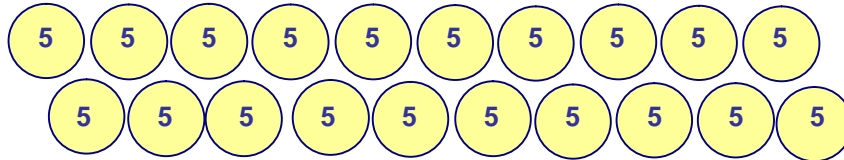
Nickels



$$5 \times 2 = 10$$



$$5 \times 5 = 25$$



$$5 \times 20 = 100$$

Examples:

$$75 \div 50 = \frac{75}{50} = \frac{3 \times \cancel{25}}{2 \times \cancel{25}} = \frac{3 \times \cancel{25}}{2 \times \cancel{25}} = \frac{3}{2}$$

$$60 \div 10 = \frac{60}{10} = \frac{6 \times \cancel{10}}{1 \times \cancel{10}} = \frac{6 \times \cancel{10}}{1 \times \cancel{10}} = 6$$

$$25 \div 40 = \frac{25}{40} = \frac{5 \times \cancel{5}}{8 \times \cancel{5}} = \frac{5 \times \cancel{5}}{8 \times \cancel{5}} = \frac{5}{8}$$

Factors, Products, *Perfect Squares*

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

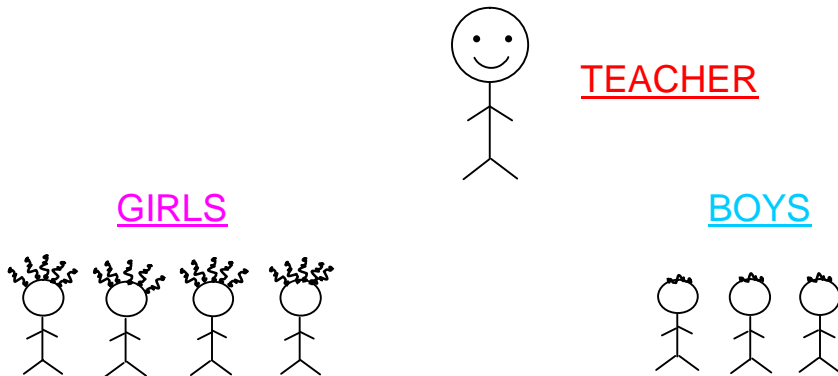
Find a Common Factor and Cancel

$$\frac{35}{21} = \frac{\overset{5 \times 7}{\cancel{35}}}{\underset{3 \times 7}{\cancel{21}}} = \frac{\overset{5 \times \cancel{7}}{\cancel{35}}}{\underset{3 \times \cancel{7}}{\cancel{21}}} = \frac{5}{3}$$

$$\frac{120}{40} = \frac{\cancel{120}}{\cancel{40}} = \frac{\overset{4 \times 3}{\cancel{12}}}{\underset{4}{\cancel{4}}} = \frac{\overset{\cancel{4} \times 3}{\cancel{12}}}{\underset{\cancel{4}}{\cancel{4}}} = 3$$

$$\frac{36}{81} = \frac{\overset{6 \times 6}{\cancel{36}}}{\underset{9 \times 9}{\cancel{81}}} = \frac{\overset{2 \times \cancel{3} \quad 2 \times \cancel{3}}{\cancel{6} \times \cancel{6}}}{\underset{9 \times 9}{\cancel{81}}} = \frac{\overset{2 \times \cancel{3} \quad 2 \times \cancel{3}}{\cancel{6} \times \cancel{6}}}{\underset{9 \times 9}{\cancel{81}}} = \frac{4}{9}$$

A Ratio Compares Two Different Quantities



Examples: Write the words, count the numbers. The ratio of girls to boys is 4 to 3.

RATIOS:

$$\frac{\text{GIRLS}}{\text{BOYS}} = \frac{4}{3} \quad (\text{Also "4:3" or "4 to 3"})$$

$$\frac{\text{BOYS}}{\text{GIRLS}} = \frac{3}{4} \quad (\text{Also "3:4" or "3 to 4"})$$

$$\frac{\text{TEACHER}}{\text{STUDENTS}} = \frac{1}{7} \quad (\text{Also "1:7" or "1 to 7"})$$

$$\frac{\text{GIRLS}}{\text{PERSONS}} = \frac{4}{8} = \frac{\cancel{4}}{\cancel{8}} \quad \text{Always express in lowest terms}$$

$\cancel{4} \times 2$

Typical GED Questions – Cancel Your Ratios

Always express in lowest terms

These easy shortcuts save precious time on the test!
Do you use them?

Example

What is the ratio of Mets fans to Yankee fans at a subway series game where there are 25,000 Mets fans and 30,000 Yankee fans?

$$\frac{\text{Mets fans}}{\text{Yankee fans}} = \frac{25,000}{30,000} = \frac{25}{30} = \frac{\cancel{5} \times 5}{\cancel{5} \times 6} = \frac{5}{6}$$

Why?

$$\begin{array}{r} \cancel{25} \times \cancel{1,000} \\ \hline \cancel{25,000} \\ \cancel{30,000} \\ \hline \cancel{30} \times \cancel{1,000} \end{array}$$

Example

Your father bought three raffle tickets, your sister bought two, and you bought one. If 18,000 tickets were sold, what are the chances that someone in your family will win?

$$\frac{3 + 2 + 1}{18,000} = \frac{\cancel{6} \times 1}{\cancel{6} \times \cancel{3,000}} = \frac{1}{3,000} \quad (\text{Or } 1:3000)$$

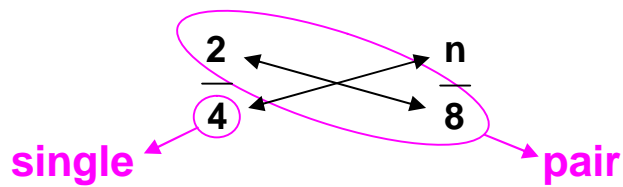
To Solve a Proportion:

$$\frac{2}{4} = \frac{n}{8}$$

Variable →

- I. Find the variable (above), and the cross products (below).

- II. Find the pair of numbers, and the single number.


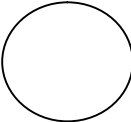

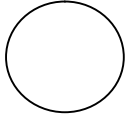


- III. Multiply the pair, divide the single.

$$n = \frac{(2)(8)}{4}$$

$$n = \frac{\cancel{4} \times 2}{\cancel{4}} = 4$$

The Perfect Proportion—Every Time!

<u>Little Ratio</u>		<u>Big Ratio</u>
 little apples	=	 BIG APPLES
<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/>  little oranges		<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/>  BIG ORANGES

1. Your “apple” quantity must be on top in both ratios.
2. Your “orange” quantity must be on the bottom.
3. Don’t mix them up!

“Apples” and “oranges” can’t **BOTH** be on top!

Typical GED Question – Basketball:

If you can score 3 points in 5 free throws, how many points can you score in 25 free throws?

$$\frac{\text{○ } 3 \text{ points}}{\text{○ } 5 \text{ free throws}} = \frac{\text{○ } n \text{ points}}{\text{○ } 25 \text{ free throws}}$$

Variable ↗

Multiply the pair,
divide the single.

$$n = \frac{3 \times 25}{5} = \frac{75}{5} = 15 \text{ points}$$

For the GED:
Cancel first, then multiply.

$$n = \frac{3 \times \cancel{25}}{\cancel{5}} = 15 \text{ points}$$

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