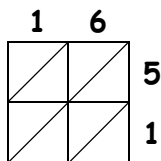


Gelocia Multiplication

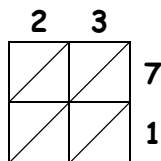
Part 1 Multiplying 2 Digit Numbers

These multiplications are set up ready for you to complete.

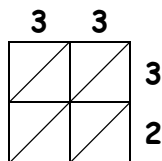
a. 16×51



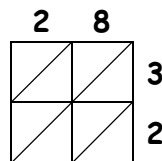
b. 23×71



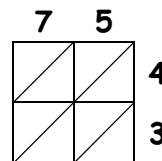
c. 33×32



d. 28×32



e. 75×43



Final answers

a. =

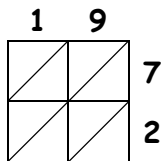
b. =

c. =

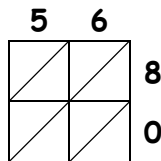
d. =

e. =

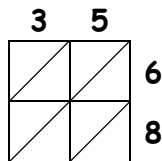
f. 19×72



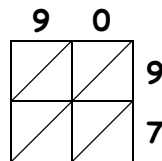
g. 56×80



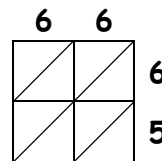
h. 35×68



i. 90×97



j. 66×65



Final answers

f. =

g. =

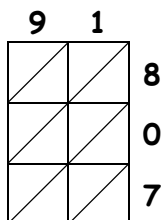
h. =

i. =

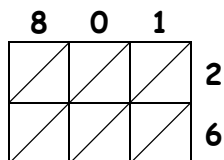
j. =

Part 2 Bigger Numbers

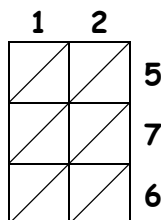
a. 91×807



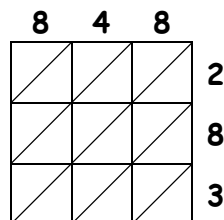
b. 801×26



c. 12×576



d. 848×283



Final answers

a. =

b. =

c. =

d. =

GELOCIA ANSWERS

Part 1 Multiplying 2 Digit Numbers

a. 16×51

	1	6	
0	0	3	5
	5	0	
8	0	0	1
	1	6	

a. = 816

b. 23×71

	2	3	
1	1	2	7
	4	1	
6	0	0	1
	2	3	

b. = 1633

c. 33×32

	3	3	
1	0	0	3
	9	9	
0	0	0	2
	6	6	

c. = 1056

d. 28×32

	2	8	
0	0	2	3
	6	4	
8	0	1	2
	4	6	

d. = 896

e. 75×43

	7	5	
3	2	2	4
	8	0	
2	2	1	3
	1	5	

e. = 3255

f. 19×72

	1	9	
1	0	6	7
	7	3	
3	0	1	2
	2	8	

f. = 1368

g. 56×80

	5	6	
4	4	4	8
	0	8	
4	0	0	0
	0	0	

g. = 4480

h. 35×68

	3	5	
2	1	3	6
	8	0	
3	2	4	8
	4	0	

h. = 2380

i. 90×97

	9	0	
8	8	0	9
	1	0	
7	6	0	7
	3	0	

i. = 8730

j. 66×65

	6	6	
4	3	3	6
	6	6	
2	3	3	5
	0	0	

j. = 4290

Part 2 Bigger Numbers

a. 91×807

	9	1	
7	7	0	8
	2	8	
3	0	0	0
	0	0	
4	6	0	7
	3	7	

a. = 73437

b. 801×26

	8	0	1	
2	1	0	0	2
	6	0	2	
0	4	0	0	6
	8	0	6	

b. = 20826

c. 12×576

	1	2	
0	0	1	5
	5	0	
6	0	1	7
	7	4	
9	0	1	6
	6	2	

c. = 6912

d. 848×283

	8	4	8	
2	1	0	1	2
	6	8	6	
3	6	3	6	8
	4	2	4	
9	2	1	2	3
	4	2	4	

d. = 239984

Division

Part 1 Rearranging the Sum

The box opposite shows a division sum that has been rearranged to make a multiplication sum.

Try working out the answers to the divisions below using this method.

$$84 \div 7 = ?$$

$$? \times 7 = 84$$

$$? = 12$$

- | | | |
|----------------|-----------------|-------------------|
| 1) $64 \div 8$ | 5) $27 \div 3$ | 9) $72 \div 6$ |
| 2) $42 \div 3$ | 6) $55 \div 5$ | 10) $121 \div 11$ |
| 3) $81 \div 9$ | 7) $84 \div 12$ | 11) $68 \div 4$ |
| 4) $49 \div 7$ | 8) $84 \div 7$ | 12) $156 \div 12$ |

Part 2 The Bus Stop Method

In the box opposite is an example of a division that has been calculated using the Bus Stop Method.

Try these divisions using the same method.

$$\begin{array}{r} 2 \overline{) 3564} \\ \underline{2} \\ 15 \\ \underline{14} \\ 16 \\ \underline{14} \\ 24 \\ \underline{24} \\ 0 \end{array}$$
$$\begin{array}{r} 2 \overline{) 3564} \\ \underline{2} \\ 15 \\ \underline{14} \\ 16 \\ \underline{14} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

- | | | |
|-----------------|------------------|--------------------|
| 1) $846 \div 2$ | 4) $888 \div 6$ | 7) $18340 \div 10$ |
| 2) $672 \div 3$ | 5) $1554 \div 7$ | 8) $384 \div 12$ |
| 3) $528 \div 4$ | 6) $2088 \div 9$ | 9) $123 \div 2$ |

Part 3 Simplifying the calculation

The division $504 \div 36$ would be difficult to do using the bus stop method. However we can simplify the calculation as shown in the box opposite.

Try doing these divisions in this way.

- | | |
|------------------|--------------------|
| 1) $288 \div 16$ | 7) $504 \div 36$ |
| 2) $266 \div 14$ | 8) $308 \div 28$ |
| 3) $162 \div 18$ | 9) $532 \div 19$ |
| 4) $168 \div 24$ | 10) $336 \div 48$ |
| 5) $456 \div 24$ | 11) $1296 \div 48$ |
| 6) $512 \div 16$ | 12) $1296 \div 96$ |

$$504 \div 36$$

Both numbers will divide by 2

$$252 \div 18$$

Both numbers will divide by 2

$$126 \div 9$$

Both numbers will divide by 3

$$42 \div 3$$

$$42 \div 3 = 14$$

Part 4 Challenge!

Using the above methods try to work out the division sum shown. No calculators!

$$177408 \div 2688$$

Division

Answers to Division Methods questions

Part 1 Rearranging the Sum

- | | | |
|---------------------|---------------------|------------------------|
| 1) $64 \div 8 = 8$ | 5) $27 \div 3 = 9$ | 9) $72 \div 6 = 12$ |
| 2) $42 \div 3 = 14$ | 6) $55 \div 5 = 11$ | 10) $121 \div 11 = 11$ |
| 3) $81 \div 9 = 9$ | 7) $84 \div 12 = 7$ | 11) $68 \div 4 = 17$ |
| 4) $49 \div 7 = 7$ | 8) $84 \div 7 = 12$ | 12) $156 \div 12 = 13$ |

Part 2 The Bus Stop Method

- | | | |
|-----------------------|------------------------|---------------------------|
| 1) $846 \div 2 = 423$ | 4) $888 \div 6 = 148$ | 7) $18340 \div 10 = 1834$ |
| 2) $672 \div 3 = 224$ | 5) $1554 \div 7 = 222$ | 8) $384 \div 12 = 32$ |
| 3) $528 \div 4 = 132$ | 6) $2088 \div 9 = 232$ | 9) $123 \div 2 = 61.5$ |

Part 3 Simplifying the calculation

- | | |
|-----------------------|---------------------------|
| 1) $288 \div 16 = 18$ | 7) $504 \div 36 = 14$ |
| 2) $266 \div 14 = 19$ | 8) $308 \div 28 = 11$ |
| 3) $162 \div 18 = 9$ | 9) $532 \div 19 = 28$ |
| 4) $168 \div 24 = 7$ | 10) $336 \div 48 = 7$ |
| 5) $456 \div 24 = 19$ | 11) $1296 \div 48 = 27$ |
| 6) $512 \div 16 = 32$ | 12) $1296 \div 96 = 13.5$ |

Part 4 Challenge!

Answer = 66

Indices

Part A Practice with Integers

Work out the value of the following indices.

1. 2^3

2. 9^2

3. 3^3

4. 5^3

5. 2^6

6. 10^4

7. 4^4

8. 7^3

9. 2^8

10. 5^5

Part B Tricky base numbers

1. $(\frac{1}{2})^3$

2. $(-4)^2$

3. $(0.5)^3$

4. $(\frac{3}{4})^2$

5. $(-2)^6$

6. $(0.2)^4$

7. $(-3)^3$

8. $(-\frac{1}{4})^2$

9. $(-0.1)^2$

10. 0^3

Part C Negative indices

Remember, you should expect most of your answers to be fractions.

1. 4^{-2}

2. 9^{-2}

3. 4^{-3}

4. 5^{-1}

5. 2^{-7}

6. 10^{-1}

7. 4^{-1}

8. 8^{-3}

9. 1^{-11}

10. 0^5

11. $(\frac{1}{2})^{-2}$

12. $(-4)^{-1}$

13. $(0.5)^{-4}$

14. $(\frac{3}{4})^{-3}$

15. $(-2)^{-3}$

Part D Equations

Work out the value of x in the equations below.

1. $49 = 7^x$

2. $25 = x^2$

3. $121 = 11^x$

4. $400 = x^2$

5. $\frac{1}{4} = \frac{1}{2}^x$

6. $\frac{1}{4} = 2^x$

7. $\frac{1}{8} = x^{-3}$

8. $1/49 = x^{-2}$

9. $36 = 2^2 \times 3^x$

10. $250 = 2 \times 5^x$

11. $88 = 11^4 \times 2^x$

12. $200 = 2^x \times 5^2$

13. $999 = 37^1 \times 3^x$

14. $1024 = 2^x$

15. $343 = 7^x$

16. $480 = 2^x \times 3^1 \times 5^1$

Part E Square roots and other fractional indices

Calculate the following:

1. $4^{1/2}$

2. $27^{1/3}$

3. $64^{1/2}$

4. $64^{1/3}$

5. $1000^{1/3}$

6. $125^{1/3}$

7. $81^{1/2}$

8. $81^{1/4}$

9. $900^{1/2}$

10. $8000^{1/3}$

11. $8^{2/3}$

12. $16^{3/4}$

13. $100^{3/2}$

14. $49^{3/2}$

15. $9^{5/2}$

16. $(1/4)^{1/2}$

17. $(0.01)^{1/2}$

18. $(0.36)^{1/2}$

19. $(9/16)^{1/2}$

20. $(-8)^{1/3}$

Indices Answers

Part A Practice with Integers

Work out the value of the following indices.

- | | | | | |
|----------|--------|--------|--------|----------|
| 1. 8 | 2. 81 | 3. 27 | 4. 125 | 5. 64 |
| 6. 10000 | 7. 256 | 8. 343 | 9. 256 | 10. 3125 |

Part B Tricky base numbers

- | | | | | |
|------------------|--------|-------------------|-------------------|-------|
| 1. $\frac{1}{8}$ | 2. 16 | 3. 0.125 | 4. $\frac{9}{16}$ | 5. 64 |
| 6. 0.0016 | 7. -27 | 8. $\frac{1}{16}$ | 9. 0.01 | 10. 0 |

Part C Negative indices

Remember, you should expect most of your answers to be fractions.

- | | | | | |
|-------------------|--------------------|--------------------|---------------------|--------------------|
| 1. $\frac{1}{16}$ | 2. $\frac{1}{81}$ | 3. $\frac{1}{64}$ | 4. $\frac{1}{5}$ | 5. $\frac{1}{128}$ |
| 6. $\frac{1}{10}$ | 7. $\frac{1}{4}$ | 8. $\frac{1}{512}$ | 9. 1 | 10. 0 |
| 11. 4 | 12. $-\frac{1}{4}$ | 13. 16 | 14. $\frac{64}{27}$ | 15. $-\frac{1}{8}$ |

Part D Equations

Work out the value of x in the equations below.

- | | | | |
|-------|--------|-------|-------|
| 1. 2 | 2. 5 | 3. 2 | 4. 20 |
| 5. 2 | 6. -2 | 7. 2 | 8. 7 |
| 9. 2 | 10. 3 | 11. 3 | 12. 3 |
| 13. 3 | 14. 10 | 15. 3 | 16. 5 |

Part E Square roots and other fractional indices

Calculate the following:

- | | | | | |
|-------------------|---------|----------|-------------------|---------|
| 1. 2 | 2. 3 | 3. 8 | 4. 4 | 5. 10 |
| 6. 5 | 7. 9 | 8. 3 | 9. 30 | 10. 20 |
| 11. 4 | 12. 8 | 13. 1000 | 14. 343 | 15. 243 |
| 16. $\frac{1}{2}$ | 17. 0.1 | 18. 0.6 | 19. $\frac{3}{4}$ | 20. -2 |