Mental multiplication strategies – doubling strategy

Doubling is a useful strategy to use when multiplying.

To multiply a number by four, double it twice.

15 × 4 double once = 30

double twice = 60

To multiply a number by eight, double it three times.

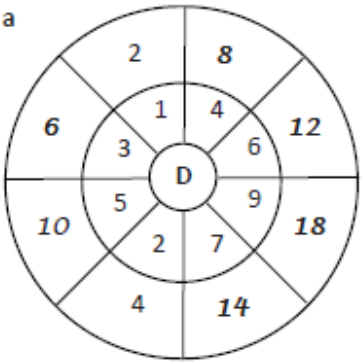
13 × 8 double once = 26

double twice = 52

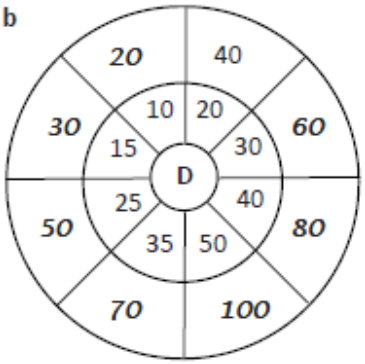
double three times = 104

1 **Warm up with some doubling practice:**

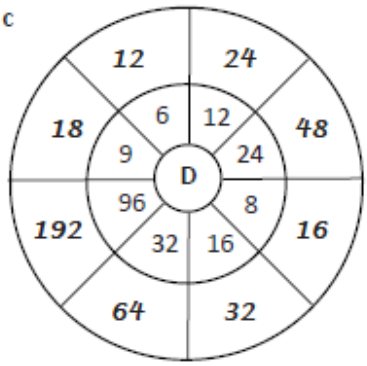
a



b



c



2 **Finish the doubling patterns:**

a 4	8	16	32	64	128
b 3	6	12	24	48	96
c 5	10	20	40	80	160
d 25	50	100	200	400	800
e 7	14	28	56	112	224
f 75	150	300	600	1 200	2 400

3 **Choose a number and create your own doubling pattern. How high can you go? What patterns can you see within your pattern?**

Answers will vary.

4 **Two sets of twins turn 12. They decide to have a joint birthday party with 1 giant cake but they all want their own candles. How many candles will they need?**

4 × 12 = 48

Mental multiplication strategies – doubling strategy

5 **Use the doubling strategy to solve these:**

		× 2	× 4
a	13 × 4	26	52
b	16 × 4	32	64
c	24 × 4	48	96
d	25 × 4	50	100
e	32 × 4	64	128
f	21 × 4	42	84
g	35 × 4	70	140

6 **Use the doubling strategy to solve these:**

		× 2	× 4	× 8
a	12 × 8	24	48	96
b	14 × 8	28	56	112
c	25 × 8	50	100	200
d	21 × 8	42	84	168
e	13 × 8	26	52	104
f	16 × 8	32	64	128

7 **Work out the answers in your head using the appropriate doubling strategy. Use a table like the one above if it helps.**

a 18 × 4 = 72 b 16 × 4 = 64 c 26 × 4 = 104

d 24 × 8 = 192 e 15 × 8 = 120 f 22 × 8 = 176

8 **Nick's dad offered him two methods of payment for helping with a 5 week landscaping project.**

Method 1: £24 a week for 5 weeks.

Method 2: £8 for the first week, then double the payment each week.

Which method would earn Nick the most money? Why?

Method 1 = £120 *24 x 5 = 120*

Method 2 = £248 *8 + 16 + 32 + 64 + 128 = 248*

Mental multiplication strategies – split strategy

Sometimes it's easier to split a number into parts and work with the parts separately.

Look at 64 × 8

Split the number into 60 and 4

Work out (60 × 8) and then (4 × 8)

Add the answers together 480 + 32 = 512

1 **Use the split strategy to answer the questions:**

a 46 × 4

(40 × 4) + (6 × 4)

160 + 24

= 184

b 74 × 5

(70 × 5) + (4 × 5)

350 + 20

= 370

c 48 × 4

(40 × 4) + (8 × 4)

160 + 32

= 192

d 37 × 7

(30 × 7) + (7 × 7)

210 + 49

= 259

e 62 × 8

(60 × 8) + (2 × 8)

480 + 16

= 496

f 91 × 5

(90 × 5) + (1 × 5)

450 + 5

= 455

2 **Use the split strategy to answer the questions. This time see if you can do the brackets in your head:**

a 48 × 8 = 320 + 64 = 384

b 52 × 7 = 350 + 14 = 364

c 9 × 43 = 360 + 27 = 387

d 8 × 29 = 160 + 72 = 232

e 86 × 7 = 560 + 42 = 602

3 **These problems have been worked out incorrectly. Circle where it all went wrong.**

a 37 × 6

(30 × 6) + (7 × 6)

180 + (13)

= 193

b 17 × 5

(10 × 5) + (7 × 5)

(70) + 35

= 105

c 32 × 9

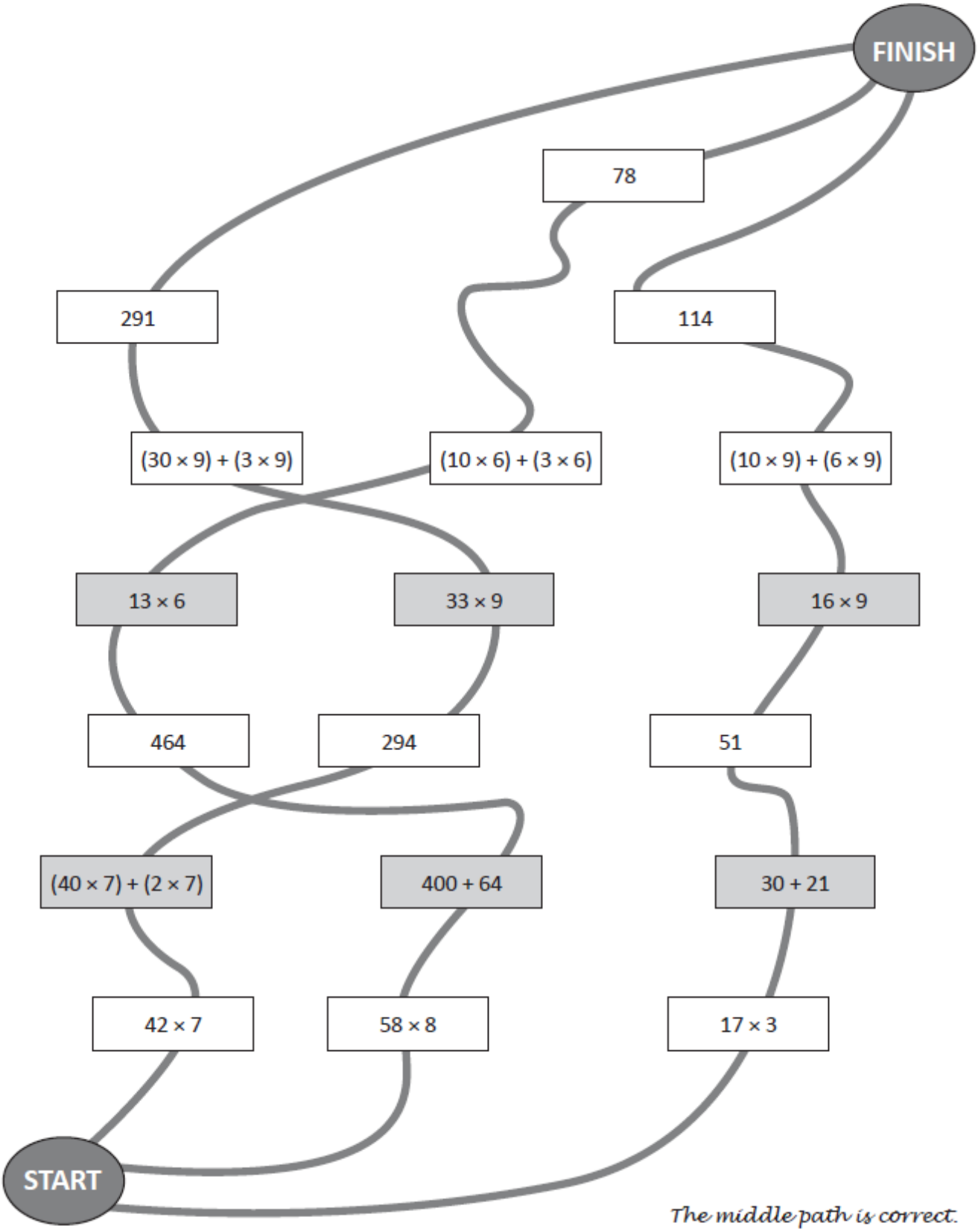
(30 × 9) + (2 × 9)

(27) + 18

= 45

Mental multiplication strategies – split strategy

4 **Each trail contains 2 multiplication problems and steps to solve them. Only one trail has been solved correctly. There are errors in the other two. Find and colour the winning trail.**



The middle path is correct.

Reading answers – day 3

1. Which detail should be in the summary?
   - a. The stork made friends with the fox.
   - b. The birds advised the stork not to make friends with the fox.
   - c. The stork was a bird with long legs, a long neck and a very long bill.

   a

2. Which detail should be in the summary?
   - a. The stork ignored the birds' advice.
   - b. The stork went round to the fox's house for supper.
   - c. The fox made delicious soup.

   b

3. Which detail should be in the summary?
   - a. The stork wasn't hungry.
   - b. The fox licked the soup from the plate.
   - c. The stork couldn't eat the soup from the shallow plate because his bill was too long.

   c

4. Which detail should be in the summary?
   - a. The stork was very disappointed.
   - b. The fox was amused.
   - c. The stork invited the fox back to his house for tea.

   c

5. Which detail should be in the summary?
   - a. Stork served the meal in tall, narrow jars.
   - b. Roast rabbit is the fox's favourite meal.
   - c. The birds watched through the window.

   a

6. Which sentence best describes how the fox feels when his snout is stuck in the jar?
   - a. The fox didn't care.
   - b. The fox was cross.
   - c. The fox was embarrassed.

   c

7. What is the theme of the story?
   - a. Treat others as you would want to be treated.
   - b. Make sure you use suitable dishes when eating.
   - c. Try and make lots of friends.

   a

Correct the Spelling Mistake **Answers**

The spelling mistakes in these sentences have been circled. Write the correct spelling for each circled word in the box.

1. Shaun loved playing football (acording) to his best friend.
2. There were no more (avalible) cinema times for that evening.
3. The princess didn't (rekognis) the prince.
4. The (foregn) exchange student loved her new school.
5. Andrew loved reading books (espeshally) before bedtime.
6. Mum (sinserly) apologised for being late.
7. "It's lovely to meet you," whispered the boy with an (orkword) smile.
8. Grandpa cooked a delicious (vegtabul) soup for dinner.

according
available
recognise
foreign
especially
sincerely
awkward
vegetable

Each sentence below has one word that is incorrect. Write the correct spelling of the word in the box.

1. How could Sarah perswad her mum to stay out later?
2. The school trip was to an anshient temple.
3. Mohammad really wanted to win the compitishion.
4. Loki, the dog, hated thunder and litening.
5. There was a worrying sound coming from the vehcle.
6. It won't be nesesary.
7. The tempracher in the classroom was increasing
8. The lady next door was being a newsance.

persuade
ancient
competition
lightning
vehicle
necessary
temperature
nuisance

Mental division strategies – use multiplication facts

Knowing our multiplication facts helps us with division as they do the reverse of each other. They are inverse operations.

$3 \times 5 = 15$ $\qquad$ $15 \div 5 = 3$

1 **Use your knowledge of multiplication facts to help answer these division questions:**

a $56 \div 7$ → $\underline{8} \times 7 = 56$ → $56 \div 7 =$ **8**

b $121 \div 11$ → $\underline{11} \times 11 = 121$ → $121 \div 11 =$ **11**

c $72 \div 8$ → $\underline{9} \times 8 = 72$ → $72 \div 8 =$ **9**

d $49 \div 7$ → $\underline{7} \times 7 = 49$ → $49 \div 7 =$ **7**

e $36 \div 9$ → $\underline{4} \times 9 = 36$ → $36 \div 9 =$ **4**

f $64 \div 8$ → $\underline{8} \times 8 = 64$ → $64 \div 8 =$ **8**

g $108 \div 12$ → $\underline{9} \times 12 = 108$ → $108 \div 12 =$ **9**

2 **Now try these:**

a $81 \div 9 =$ **9**

b $40 \div 5 =$ **8**

c $21 \div 3 =$ **7**

d $54 \div 6 =$ **9**

e $42 \div 7 =$ **6**

f $63 \div 9 =$ **7**

g $36 \div 4 =$ **9**

h $45 \div 9 =$ **5**

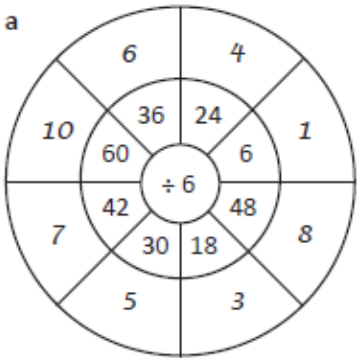
i $39 \div 3 =$ **13**

j $24 \div 6 =$ **4**

Doing maths without knowing your multiplication facts is hard. Learning them makes your life much easier. It's worth persevering to conquer them!

3 **Fill in the division wheels. Use multiplication facts to help you.**

a



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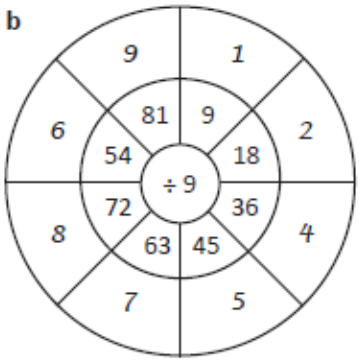
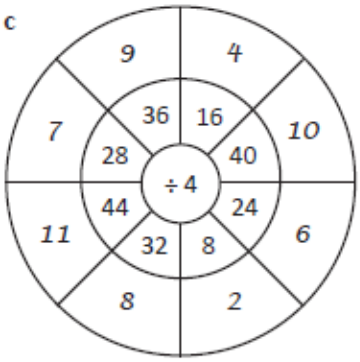


c



Mental division strategies – use multiplication facts

Knowing our families of facts is also helpful.

$3 \times 5 = 15$ $5 \times 3 = 15$ $15 \div 5 = 3$ $15 \div 3 = 5$

4 **Complete the following patterns. How many more multiplication and division facts can you find, given the first fact?**

a $7 \times 8 = 56$

$8 \times 7 = \boxed{56}$

$56 \div \boxed{7} = 8$

$\boxed{56} \div 8 = 7$

b $8 \times 9 = 72$

$9 \times 8 = \boxed{72}$

$72 \div \boxed{8} = 9$

$\boxed{72} \div 9 = 8$

c $7 \times 9 = 63$

$9 \times 7 = \boxed{63}$

$63 \div \boxed{7} = 9$

$\boxed{63} \div 9 = 7$

5 **Write down another multiplication fact and two division facts for each question.**

a $6 \times 7 = 42$

$7 \times 6 = 42$

$42 \div 6 = 7$

$42 \div 7 = 6$

b $5 \times 9 = 45$

$9 \times 5 = 45$

$45 \div 9 = 5$

$45 \div 5 = 9$

c $9 \times 6 = 54$

$6 \times 9 = 54$

$54 \div 6 = 9$

$54 \div 9 = 6$

d $17 \times 8 = 136$

$8 \times 17 = 136$

$136 \div 8 = 17$

$136 \div 17 = 8$

e $12 \times 8 = 96$

$8 \times 12 = 96$

$96 \div 8 = 12$

$96 \div 12 = 8$

f $11 \times 21 = 231$

$21 \times 11 = 231$

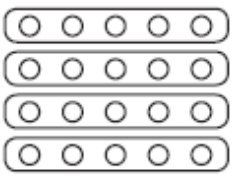
$231 \div 21 = 11$

$231 \div 11 = 21$

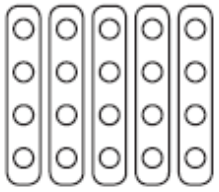
6 **Look at these two division facts:** $20 \div 5 = 4$ **and** $20 \div 4 = 5$

Imagine you're explaining to a younger child how they're related yet different. How would you do it? What would you say/write/draw?

$20 \div 5 = 4$



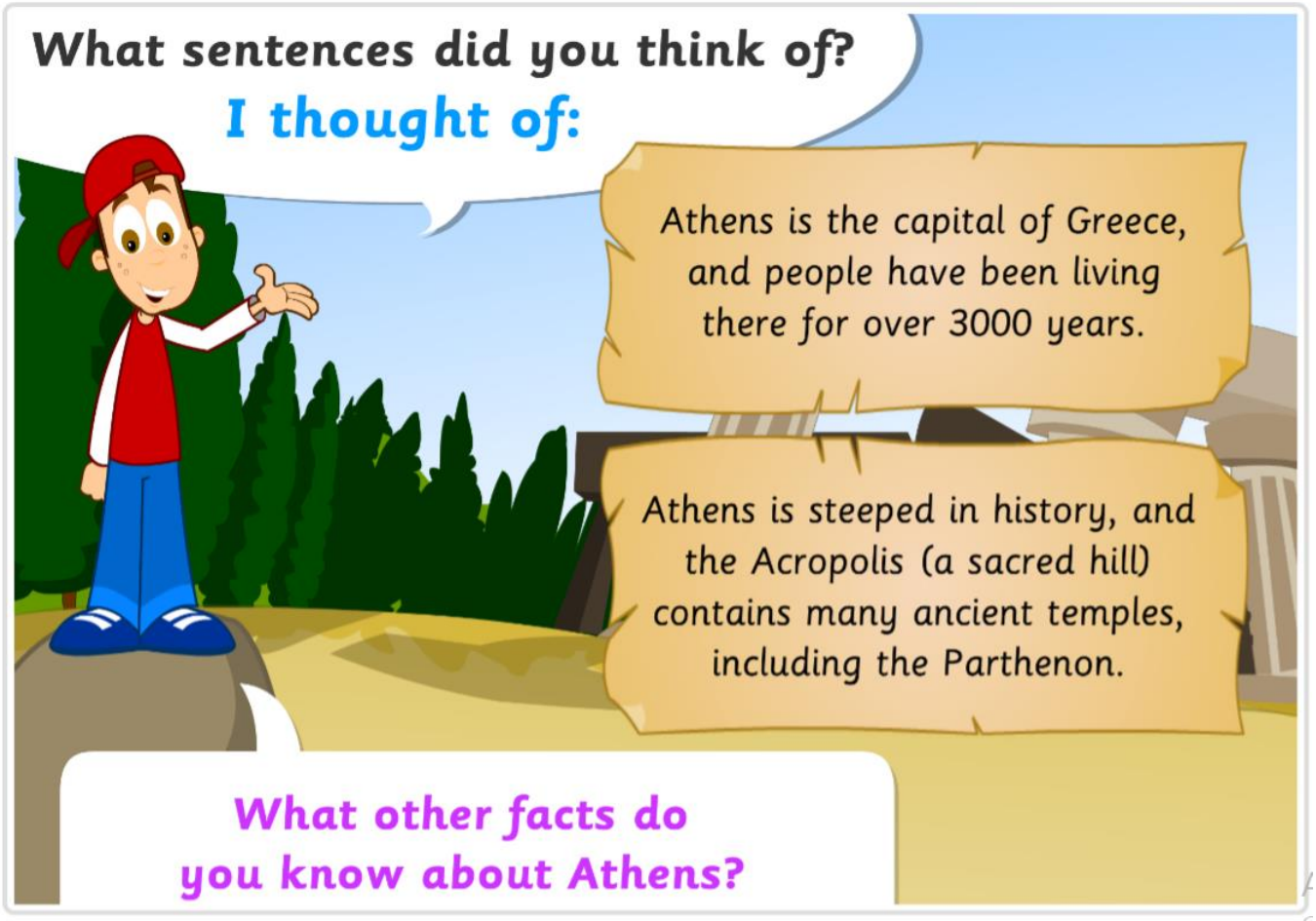
$20 \div 4 = 5$



Sample answer.

One way you could answer this is:

Name : _____ Class: _____ EducationCity



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

3 x 12 = 36	120 ÷ 12 = 10	36 ÷ 3 = 12

Master Master Challenge

72 ÷ 8 = 9	6 ÷ 1 = 6	56 ÷ 7 = 8	18 ÷ 2 = 9
64 ÷ 8 = 8	18 ÷ 3 = 6	24 ÷ 3 = 8	40 ÷ 8 = 5
28 ÷ 7 = 44	30 ÷ 6 = 5	8 ÷ 8 = 1	56 ÷ 7 = 8
9 ÷ 9 = 1	32 ÷ 8 = 4	12 ÷ 4 = 3	24 ÷ 6 = 4
54 ÷ 9 = 6	12 ÷ 4 = 3	35 ÷ 7 = 5	12 ÷ 2 = 6
40 ÷ 8 = 5	18 ÷ 6 = 3	15 ÷ 3 = 3	9 ÷ 1 = 9
1 ÷ 1 = 1	16 ÷ 8 = 2	56 ÷ 8 = 7	35 ÷ 7 = 5
63 ÷ 9 = 7	2 ÷ 2 = 1	36 ÷ 4 = 9	42 ÷ 6 = 7
27 ÷ 9 = 3	36 ÷ 4 = 9	9 ÷ 1 =9	15 ÷ 5 = 3
16 ÷ 2 = 8	54 ÷ 6 = 9	12 ÷ 6 = 2	6 ÷ 1 = 6
7 ÷ 1 = 7	72 ÷ 9 =8	36 ÷ 9 = 4	9 ÷ 9 = 1
12 ÷ 3 = 4	14 ÷ 2 = 7	30 ÷ 5 = 6	24 ÷ 6 = 4
27 ÷ 3 = 9	24 ÷ 4 = 6	6 ÷ 1 = 6	45 ÷ 5 = 9
10 ÷ 2 = 5	30 ÷ 6 = 5	48 ÷ 6 = 8	8 ÷ 4 = 2
16 ÷ 4 = 4	45 ÷ 9 = 9	2 ÷ 2 = 1	7 ÷ 1 = 7
3 ÷ 3 = 1	16 ÷ 4 = 4	21 ÷ 7 = 3	9 ÷ 9 = 1
18 ÷ 3 = 6	21 ÷ 7 = 3	9 ÷ 3 = 3	30 ÷ 5 = 6
40 ÷ 5 = 8	81 ÷ 9 = 9	30 ÷ 6 = 5	32 ÷ 4 = 8
32 ÷ 4 = 8	16 ÷ 2 = 8	14 ÷ 2 = 7	12 ÷ 3 = 4
24 ÷ 4 = 6	35 ÷ 5 = 7	56 ÷ 8 = 7	63 ÷ 9 = 7
45 ÷ 5 = 9	49 ÷ 7 = 7	36 ÷ 4 =9	24 ÷ 8 = 3
40 ÷ 5 = 8	54 ÷ 9 = 6	18 ÷ 9 = 2	25 ÷ 5 = 5
20 ÷ 4 = 5	15 ÷ 3 = 5	20 ÷ 5 = 4	32 ÷ 4 = 8
48 ÷ 6 = 8	20 ÷ 5 = 4	24 ÷ 8 = 3	36 ÷ 9 = 4
54 ÷ 6 = 9	28 ÷ 7 = 4	24 ÷ 4 = 6	48 ÷ 8 = 6