Divisibility

☐Determine and explain why a number is divisible by 2,3,4,5,6,8,9 or 10, and why a number cannot be divided by 0.

÷

8

0

5

6

9

3

10

LCM

4

√

GCF

2

Name: _____

Divisibility

Determine if a given number is divisible by **2, 5, or 10**, and explain why.

Determine if a given number is divisible by **3**, and explain why.

Determine if a given number is divisible by **9** and explain why.

Determine if a given number is divisible by **6**, and explain why.

Determine if a given number is divisible by **4**, and explain why

Determine if a given number is divisible by 8, and explain why.

Determine if a given number is divisible by 0, and explain why.

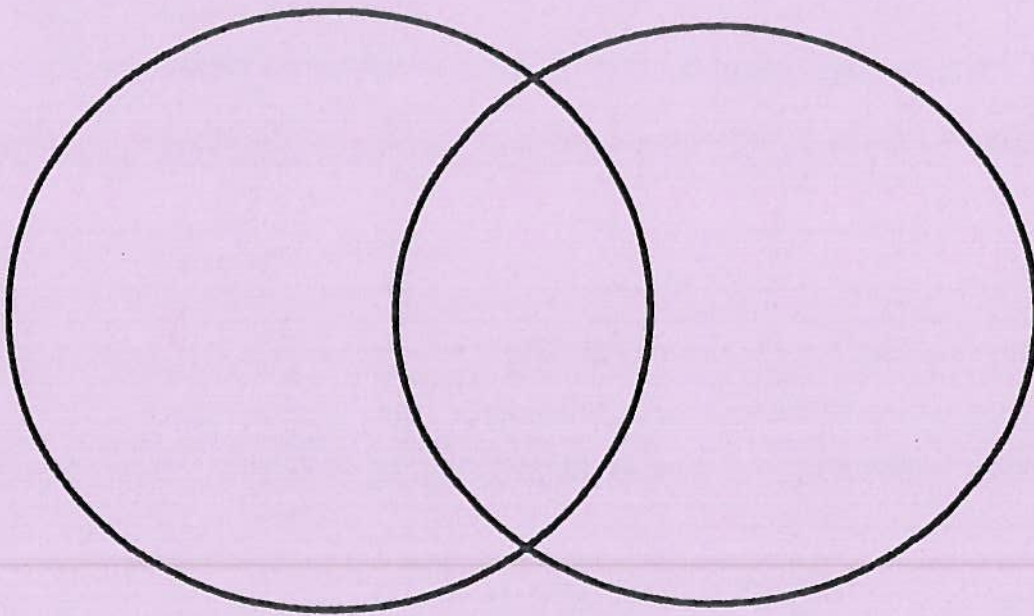Sort a given set of numbers based upon their divisibility, using organizers such as Venn and Carroll

Determine the factors of a given number, using the divisibility rules diagrams.

1.1 Divisibility by 10, 5, and 2

GOAL

> Create and use divisibility rules to determine if 10, 5, or 2 is a factor of a whole number.

1. For each number, answer these questions:
   - Is it an even number?
   - Does it end in 5 or 0?
   - Does it end in 0?

   Then, circle the factor(s) of the number.

   a) 2458   Circle the factor(s): 10   5   2

   b) 147 905   Circle the factor(s): 10   5   2

   c) 3 324 670   Circle the factor(s): 10   5   2

   d) 21 875   Circle the factor(s): 10   5   2

   e) 190   Circle the factor(s): 10   5   2

   f) 3 832   Circle the factor(s): 10   5   2

2. Create a 5-digit number to fit each of the following rules.

   a) This number is divisible by 5 but not by 10 or 2.

   b) This number is divisible by 2 but not by 10 or 5.

   c) This number is divisible by 10, 5, and 2.

3. List all the numbers between 3400 and 3500 that are divisible by 10, 5, and 2. Explain your thinking.

1) Complete the Ven diagram

14	20	200	288	306	34
65	60	36	18	25	30
78	2006	385	7660	10	28

Div by 2   Div by 5

Both
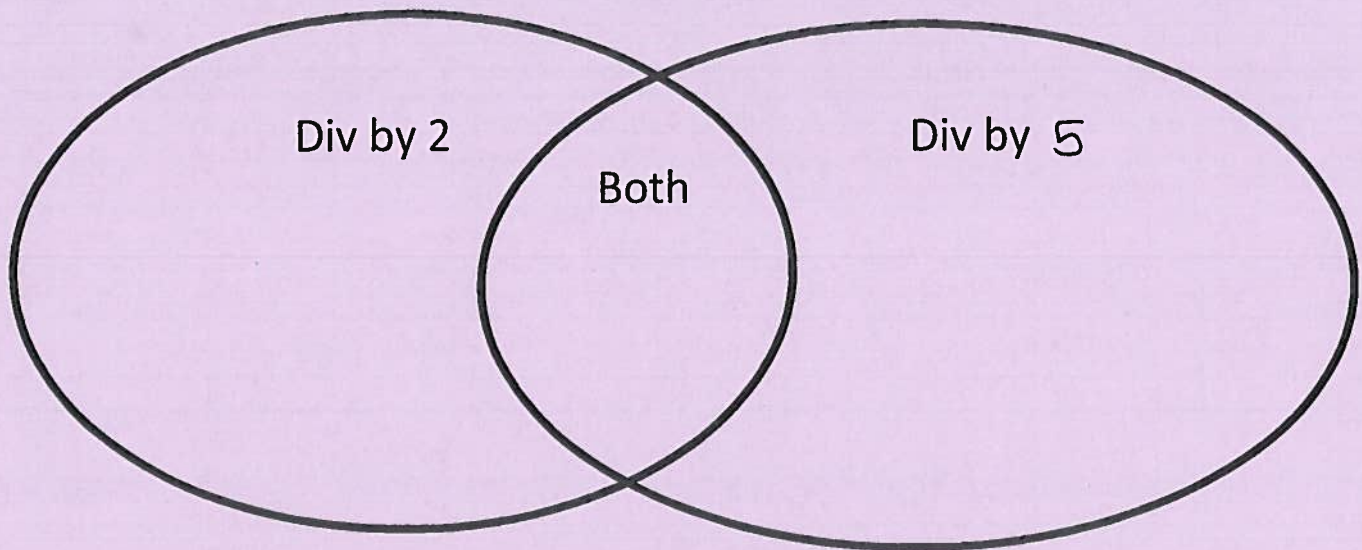
2) Complete the Ven diagram

20	45	60	50	85	1005
30	75	1000	95	300	35

Div by 5   Div by 10

Both
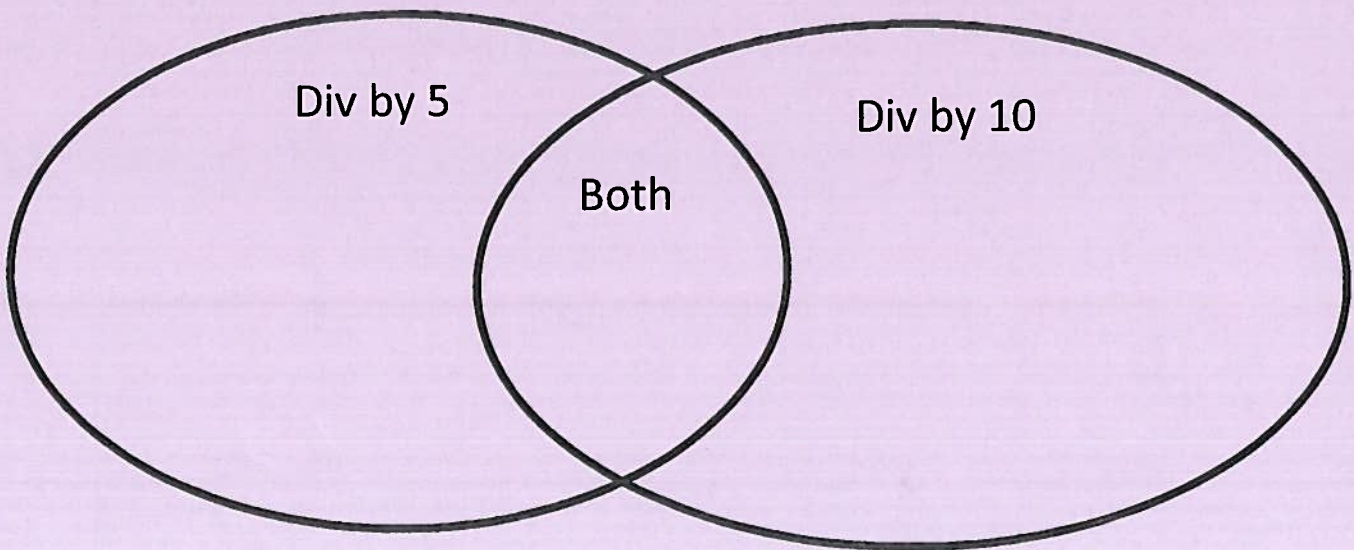
Divisibility Rules for 2, 5, and 10 (A)

Circle the numbers that are divisible by the number given.

Divisible by 2?

34	99	59	52	78	67	32	52
46	40	31	79	64	23	78	41
35	69	55	11	93	18	17	79

Divisible by 5?

82	49	87	61	56	23	71	25
40	85	57	42	43	89	42	82
37	12	34	22	53	87	88	49

Divisible by 10?

53	91	58	36	99	21	31	44
87	61	58	25	86	98	51	20
10	41	57	64	10	31	42	49

Divisible by 2 and 5?

38	29	77	42	19	16	77	86
15	80	77	55	29	35	45	34
55	90	69	69	74	55	34	28

Divisible by 5 and 10?

50	85	84	62	15	76	98	74
12	59	30	66	97	34	85	80
84	10	47	67	73	60	94	79

1.2 Divisibility by 3 and 9

1. Which of these numbers are divisible by 3? Use divisibility rules.

   a) 7317

   b) 19 333

   c) 1863

   d) 10 781

   e) 67 398

   f) 33 332

At-Home | Help

Some Divisibility Rules
- If the sum of a number's digits is a multiple of 3, the number is divisible by 3.

  For example, 342 (sum of digits = 3 + 4 + 2 = 9) is divisible by 3.
- If the sum of a number's digits is a multiple of 9, the number is divisible by 9.

  For example, 342 (sum of digits = 3 + 4 + 2 = 9) is also divisible by 9.

2. Which of these numbers are divisible by 9? Use divisibility rules.

   a) 9102

   b) 71 451

   c) 27 000

   d) 25 278

   e) 88 002

   f) 1462

3. Determine whether each number is divisible by 3. Divide by 3 to check your answer.

   a) 915

   b) 11 100

   c) 712 233

4. Fill in the missing digit to make each number divisible by 9.

   a) 67____2

   b) 256____

   c) 5____20

   d) ____211

5. What is the greatest number between 5000 and 6000 that is divisible by both 3 and 9? Explain your thinking.

Divisibility Rules for 3, 6, and 9 (A)

Circle the numbers that are divisible by the number given.

Divisible by 3?

562	491	187	702	360	427	344	965
444	127	185	814	933	458	799	847
432	355	760	763	241	477	139	640

Divisible by 6?

773	701	553	684	162	501	619	985
776	816	883	212	934	295	466	811
431	945	143	336	861	526	864	909

Divisible by 9?

986	386	342	143	350	201	611	368
267	160	168	904	919	201	314	545
621	741	579	851	326	501	422	577

Divisible by 3 and 6?

536	962	254	849	944	719	360	660
808	633	829	198	973	104	174	120
539	396	991	792	485	207	147	525

Divisible by 3 and 9?

166	514	440	935	470	557	328	665
295	791	354	742	855	888	402	795
699	153	377	116	615	514	541	659

1.3 Divisibility by 6

GOAL

Create and use a rule to determine if 6 is a factor of a whole number.

1. Which of these numbers is divisible by 2? Use divisibility rules.

   a) 6210

   b) 73 198

   c) 22 973

   d) 110 736

2. Which of these numbers is divisible by 3? Use divisibility rules.

   a) 9102

   b) 71 451

   c) 25 278

   d) 88 002

3. Which of the numbers in questions 1 and 2 are also divisible by 6?

4. Circle each correct factor.

   a) 1862:   2   3   5   6   9   10

   b) 25 716:   2   3   5   6   9   10

   c) 387:   2   3   5   6   9   10

   d) 70 000:   2   3   5   6   9   10

   e) 42 831:   2   3   5   6   9   10

   f) 2 732 445: 2   3   5   6   9   10

5. Fill in the missing digit to make each number divisible by 6. There may be more than one correct answer.

   a) 98__8   b) 9__24   c) 783__   d) __062

6. Explain why no odd number is divisible by 6. Give examples.

1.4 Divisibility by 4 and 8

Explain and apply divisibility rules to decide if 4 or 8 is a factor of a whole number.

1. Answer the questions to determine which numbers are divisible by 4.

   a) 9102

   Multiply the tens digit by 2: _____

   Add this to the ones digit: _____

   Is 9102 divisible by 4? _____

   b) 71 452

   Multiply the tens digit by 2: _____

   Add this to the ones digit: _____

   Is 71 452 divisible by 4? _____

2. Answer the questions to determine which numbers are divisible by 8.

   a) 8372

   Multiply the hundreds digit by 4: _____

   Multiply the tens digit by 2: _____

   Add these to the ones digit: _____

   Is 8372 divisible by 8? _____

   b) 20 328

   Multiply the hundreds digit by 4: _____

   Multiply the tens digit by 2: _____

   Add these to the ones digit: _____

   Is 20 328 divisible by 8? _____

3. The chamber choir has 1348 members. Can the choir leader organize the choir into even rows of 4 or 8?

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Some Divisibility Rules

- Multiply the tens digit by 2 and add the sum of this product to the ones digit. If the sum is divisible by 4, then the number is also divisible by 4.

  For example, 464 is divisible by 4 because $6 \times 2 + 4 = 16$, and 18 is divisible by 4.

- Multiply the hundreds digit by 4 and the tens digit by 2. Add the sum of these products to the ones digit. If the sum is divisible by 8, then the number is also divisible by 8.

  For example,

Hundreds	Tens	Ones
4	6	4

Multiply the hundreds digit by 4: $4 \times 4 = 16$

Multiply the tens digit by 2: $6 \times 2 = 12$

Add the sum of these products to the ones digit: $16 + 12 + 4 = 32$

32 is divisible by 8, so 464 is divisible by 8.

Grade 7 Math - Divisibility by 4

9432

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 9432 divisible by 4? _____

312

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 312 divisible by 4? _____

12 456

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 12456 divisible by 4? _____

670

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 670 divisible by 4? _____

3172

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 3172 divisible by 4? _____

14 537

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 14 537 divisible by 4? _____

45 098

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 45 098 divisible by 4? _____

8834

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 8834 divisible by 4? _____

1 235 988

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 1 235 988 divisible by 4? _____

16 060

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 4? _____

Is 16 060 divisible by 4? _____

9440

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 9440 divisible by 8? _____

15 776

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 15 776 divisible by 8? _____

12 456

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 12 456 divisible by 8? _____

5586

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 5586 divisible by 8? _____

3176

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 3176 divisible by 8? _____

14 536

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 14 536 divisible by 8? _____

45 098

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 45 098 divisible by 8? _____

8836

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 8836 divisible by 8? _____

1 235 912

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 1 235 912 divisible by 8? _____

16 660

Multiply the **Hundreds** digit by 4 _____

Multiply the **tens** digit by 2 _____

Add this to the **ones** digit _____

Is the sum divisible by 8? _____

Is 16 660 divisible by 8? _____