

If a is divisible by b , and b is divisible by c , then a is divisible by c .

For example,

$42 = 6 \times 7$, so 42 is divisible by 6.

$6 = 3 \times 2$, so 6 is divisible by 3.

Therefore, $42 = 6 \times 7$
 $= (3 \times 2) \times 7$
 $= 3 \times (2 \times 7)$
 $= 3 \times 14,$

and 42 is divisible by 3.

In short, 42 is divisible by 6, and 6 is divisible by 3. So, 42 is divisible by 3.



PRACTICE

Circle true or false for each statement below. Try to answer each problem without using long division.

- | | |
|--|--------------------------|
| 116. 156 is divisible by 12, so 156 is definitely divisible by 4. | 116. true / false |
| 117. A number x is divisible by 15, so x is definitely divisible by 3. | 117. true / false |
| 118. A number y is divisible by 22, so y is definitely divisible by 44. | 118. true / false |
| 119. Every number that is divisible by 3 is divisible by 6. | 119. true / false |
| 120. Every multiple of 21 is divisible by 7. | 120. true / false |
| 121. Every number that is divisible by 4 and by 6 is divisible by $4 \times 6 = 24$. | 121. true / false |
| 122. How can you quickly tell that 5,971 is definitely not divisible by 14? | |



PRACTICE | Solve each problem below.

- 123.** Winnie writes down a number. She tells Grogg, “My number is divisible by 100.” List 8 other numbers that Winnie’s number is definitely divisible by.

_____, _____, _____, _____, _____, _____, _____, _____

- 124.** Is 5,100 divisible by 25? If so, how can you tell?



- 125.** *Without dividing 25 into each number*, find and circle the number below that is divisible by 25.

5,105 5,115 5,125 5,135 5,145

- 126.** Is 1,234,567,890 divisible by 25? How can you tell?



- 127.** Is 678,900 divisible by 4? How can you tell?



- 128.** *Without dividing 4 into each number*, find and circle the number below that is divisible by 4.

710 720 725 734 750

- 129.** Is 98,765,432 divisible by 4? How can you tell?



DIVISION

Divisibility Rules

The descriptions below give ways to recognize divisibility by 2, 5, 10, 100, 25, and 4.

Find out more about these rules and why they work in Guide 4B on pages 67-75.



2: A number is divisible by 2 if and only if its units digit is even.
For example, 408 and 602 are divisible by 2, but 985 and 513 are not.

5: A number is divisible by 5 if and only if its units digit is 0 or 5.
For example, 985 and 630 are divisible by 5, but 231 and 5,936 are not.

10: A number is divisible by 10 if and only if its units digit is 0.
For example, 740 and 20,680 are divisible by 10, but 787 and 10,099 are not.

100: A number is divisible by 100 if and only if it ends in 00.
For example, 9,200 and 12,600 are divisible by 100, but 407 and 7,090 are not.

25: A number is divisible by 25 if and only if the number formed by its last two digits is divisible by 25. A number that ends in 00, 25, 50, or 75 is divisible by 25.
For example, 275 and 12,625 are divisible by 25, but 257 and 1,715 are not.

4: A number is divisible by 4 if and only if the number formed by its last two digits is divisible by 4. A number that ends in 00, 04, 08, ..., 88, 92, or 96 is divisible by 4.
For example, 608 and 8,960 are divisible by 4, but 1,826 and 4,062 are not.

For one-digit numbers, we can add as many leading zeros as we need in order to use these tests. For example, $0 = 00$ and $8 = 08$ are divisible by 4.

PRACTICE | Answer each question below.

130. Circle all of the numbers below that are divisible by 25:

9,855 5,485 10,025 1,400

131. Circle all of the numbers below that are divisible by 5 but **not** by 2:

5,553 65,800 1,395 6,480

132. Circle all of the numbers below that are divisible by 4:

6,700 2,196 5,018 5,434

PRACTICE | Answer each question below.

133. What is the smallest number you can add to 19,056 that will make the sum divisible by 25? **133.** _____

134. Circle the two numbers below whose *sum* is divisible by 25:

9,802 1,488 4,137 5,135

135. Arrange the squares below so that the digits form a 4-digit number that is divisible by 4. Write the 4-digit number you create. **135.** _____

| | | |
|---|---|----|
| 4 | 5 | 62 |
|---|---|----|

136. Arrange the squares below into pairs to create two 3-digit numbers such that one of the numbers is divisible by 4 and the other is divisible by 25. Write both numbers you create. **136.** _____

| | | | |
|---|---|----|----|
| 4 | 5 | 18 | 47 |
|---|---|----|----|

137. Arrange the squares below into pairs to create two 3-digit numbers such that one of the numbers is divisible by 4 and the other is divisible by 25. Write both numbers you create. **137.** _____

| | | | |
|---|---|----|----|
| 5 | 6 | 75 | 82 |
|---|---|----|----|

138.

| | | | |
|---|---|---|---|
| 4 | 1 | A | 6 |
|---|---|---|---|

 is a four-digit number that is divisible by 4. What digit (or digits) could *A* be?

