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Reteaching 3-1

Divisibility and Mental Math

A number is *divisible* by a second number if the second number divides into the first with no remainder. Here are some rules.

Last Digit of a Number	The Number Is Divisible by	Examples
any	1	any number
0, 2, 4, 6, 8	2	10; 24; 32; 54; 106; 138
0, 5	5	10; 25; 70; 915; 1,250
0	10	10; 20; 90; 500; 4,300

The Sum of the Digits	The Number Is Divisible by	Examples	
is divisible by 3	3	843 → $8 + 4 + 3 = 15$ and $15 \div 3 = 5$	$3\overline{)843}$ = 281 R0
is divisible by 9	9	2,898 → $2 + 8 + 9 + 8 = 27$ and $27 \div 9 = 3$	$9\overline{)2{,}898}$ = 322 R0

Circle the numbers in each row that are divisible by the number at the left.

1.	2	8	15	26	42	97	105	218
2.	5	14	10	25	18	975	1,005	2,340
3.	10	100	75	23	60	99	250	655
4.	3	51	75	12	82	93	153	274
5.	9	27	32	36	108	126	245	387

Use mental math to determine if the first number is divisible by the second.

6. 185; 5 ____________

7. 76,870; 10 ____________

8. 456; 3 ____________

9. 35,994; 2 ____________

10. 12,866; 9 ____________

11. 151,002; 9 ____________

12. 6,888; 2 ____________

13. 31,067; 5 ____________

14. 901,204; 3 ____________

15. 2,232; 3 ____________

16. 45,812; 9 ____________

17. 3,090; 10 ____________

18. 312; 9 ____________

19. 1,933; 3 ____________

20. 28,889; 2 ____________

Test each number for being divisible by 2, 5, or 10. Some numbers may be divisible by more than one number.

21. 800 ____________

22. 65 ____________

23. 1, 010 ____________

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Reteaching 3-2

Exponents

An *exponent* tells how many times a number is used as a factor.

$3 \times 3 \times 3 \times 3$ shows the number 3 is used as a factor 4 times.

$3 \times 3 \times 3 \times 3$ can be written 3^4.

In 3^4, 3 is the *base* and 4 is the exponent.

Read 3^4 as "three to the fourth power."

- To *simplify* a power, first write it as a product.

  $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

- When you simplify expressions with exponents, do all operations inside parentheses first. Then simplify the powers.

  Example: $30 - (2 + 3)^2 = 30 - 5^2$
  $= 30 - 25$
  $= 5$

Name the base and the exponent.

1. 3^6

base ________

exponent ________

2. 6^2

base ________

exponent ________

3. 8^4

base ________

exponent ________

Write each expression using an exponent. Name the base and the exponent.

4. $9 \times 9 \times 9$ ________________

5. $6 \times 6 \times 6 \times 6$ ________________

6. $1 \times 1 \times 1 \times 1 \times 1$ ________________

Simplify each expression.

7. 6^2 ________________

8. 3^5 ________________

9. 10^4 ________________

10. $4^2 + 5^2$ ________________

11. $2 \times 6 - 2^3$ ________________

12. $6^2 + 4^2$ ________________

13. $5 + 5^2 - 2$ ________________

14. $24 \div 4 + 2^4$ ________________

15. $9 + (40 \div 2^3)$ ________________

16. $(4^2 + 4) \div 5$ ________________

17. $10 \times (30 - 5^2)$ ________________

18. $12 + 18 \div 3^2$ ________________

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Reteaching 3-3

Prime Numbers and Prime Factorization

A *prime number* has exactly two factors, the number itself and 1.

$5 \times 1 = 5$
5 is a prime number.

A *composite number* has more than two factors.

$1 \times 6 = 6$
$2 \times 3 = 6$

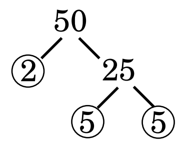
1, 2, 3, and 6 are factors of 6.
6 is a composite number.

The number 1 is neither prime nor composite.

Every composite number can be written as a product of prime numbers.

$6 = 2 \times 3$
$8 = 2 \times 2 \times 2$
$12 = 2 \times 2 \times 3$

Factors that are prime numbers are called *prime factors.* You can use a *factor tree* to find prime factors. This one shows the prime factors of 50.



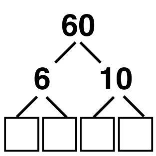
$50 = 2 \times 5 \times 5$ is the *prime factorization* of 50.

Tell whether each number is prime or composite. Explain.

1. 21 ____________
2. 43 ____________
3. 53 ____________
4. 74 ____________
5. 54 ____________
6. 101 ____________
7. 67 ____________
8. 138 ____________
9. 83 ____________
10. 95 ____________
11. 41 ____________
12. 57 ____________

Complete each factor tree.

13.



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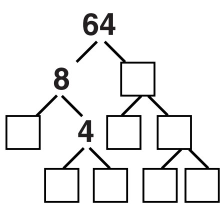

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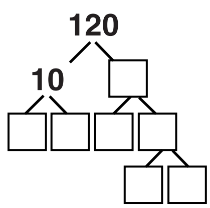

Find the prime factorization of each number.

16. 21 ____________
17. 48 ____________
18. 81 ____________
19. 63 ____________
20. 100 ____________
21. 103 ____________

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Reteaching 3-4

Greatest Common Factor

You can find the *greatest common factor (GCF)* of 12 and 18 using a division ladder, factor trees, or by listing the factors. Two of these methods are shown.

(1) List the factors of 12 and 18.

12: 1, 2, 3, 4, 6, 12
18: 1, 2, 3, 6, 9, 18

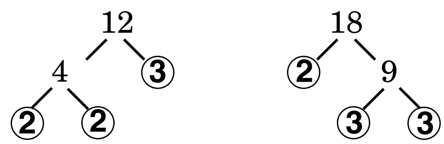
(2) Find the common factors.

12: (1), (2), (3), 4, (6), 12
18: (1), (2), (3), (6), 9, 18

The common factors are 1, 2, 3, and 6.

(3) Name the greatest common factor: 6.

(1) Draw factor trees.



(2) Write each prime factorization. Identify common factors.

12: (2) × 2 × (3)
18: (2) × (3) × 3

(3) Multiply the common factors. $2 \times 3 = 6$.
The GCF of 12 and 18 is 6.

List the factors to find the GCF of each set of numbers.

1. 10: ______
15: ______
GCF: ______

2. 14: ______
21: ______
GCF: ______

3. 9: ______
21: ______
GCF: ______

4. 12: ______
13: ______
GCF: ______

5. 15: ______
25: ______
GCF: ______

6. 15: ______
18: ______
GCF: ______

7. 36: ______
48: ______
GCF: ______

8. 24: ______
30: ______
GCF: ______

Find the GCF of each set of numbers.

9. 21, 60 ______

10. 15, 45 ______

11. 54, 60 ______

12. 20, 50 ______

13. 36, 40 ______

14. 48, 72 ______

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Reteaching 3-5

Least Common Multiple

Find the *least common multiple (LCM)* of 8 and 12.

① Begin listing multiples of each number.

8: 8, 16, 24, 32, 40

12: 12, 24

② Continue the lists until you find the first multiple that is common to both lists. That is the LCM.

The least common multiple of 8 and 12 is 24.

List multiples to find the LCM of each pair of numbers.

1. 4: ______________

5: ______________

LCM: ______________

2. 6: ______________

7: ______________

LCM: ______________

3. 9: ______________

15: ______________

LCM: ______________

4. 10: ______________

25: ______________

LCM: ______________

5. 8: ______________

24: ______________

LCM: ______________

6. 8: ______________

12: ______________

LCM: ______________

7. 4: ______________

7: ______________

LCM: ______________

8. 15: ______________

25: ______________

LCM: ______________

Use prime factorization to find the LCM of each set of numbers.

9. 9, 21 ______________

10. 6, 8 ______________

11. 18, 24 ______________

12. 40, 50 ______________

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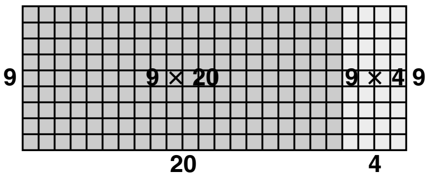
Reteaching 3-6

The Distributive Property

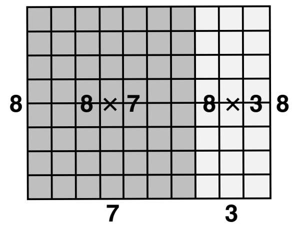
The *Distributive Property* allows you to break numbers apart to make mental math easier.



Multiply 9×24 mentally.

Think: $9 \times 24 = 9 \times (20 + 4)$
$= (9 \times 20) + (9 \times 4)$
$= 180 + 36$
$= 216$

The Distributive Property may also help you to simplify an expression.



$(8 \times 7) + (8 \times 3) = 8 \times (7 + 3)$
$= 8 \times 10$
$= 80$

Use the Distributive Property to find the missing numbers in the equation.

1. $(6 \times \square) - (\square \times 3) = 6 \times (5 - 3)$
2. $4 \times (\square - 3) = (\square \times 9) - (4 \times \square)$
3. $(\square \times 7) - (6 \times \square) = 6 \times (7 - 5)$
4. $\square \times (12 + 8) = (6 \times \square) + (\square \times 8)$

Use the Distributive Property to rewrite and simplify each expression.

5. $(2 \times 7) + (2 \times 5)$
6. $8 \times (60 - 5)$
7. $(7 \times 8) - (7 \times 6)$
8. $(12 \times 3) + (12 \times 4)$

Use the Distributive Property to simplify each expression.

9. 3×27
10. 5×43
11. 8×59
12. 7×61
13. 5×84
14. 6×53

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Reteaching 3-7

Simplifying Algebraic Expressions

A *term* is a number, a variable, or the product of number and one or more variables.
The number before the variable is the *coefficient*.

Given: $5a^2 + 8b + c$
The terms are $5a^2$, $8b$, and c.
The coefficients are 5, 8, and 1.
The variables are a^2, b, and c.

"Like" terms have the same variables, but may have different coefficients.
Given: $5a^2 + 8b + c + 2a^2 + 8b^2 - 3b - 4c$
The "like" terms include:
$5a^2$ and $2a^2$ because they both contain a^2
c and $-4c$ because they both contain c

Simplify expression by combining "like" terms using the properties of operations.
Given: $5a^2 + 8b + c + 2a^2 + 8b^2 - 3b - 4c$
Simplify: $(5a^2 + 2a^2) + 8b^2 + (8b - 3b) + (c - 4c)$
Answer: $7a^2 + 8b^2 + 5b - 3c$

Find an equivalent expression for each expression by simplifying.

1. $3b + 4 + 5b$ ______

2. $7 + 4x - x$ ______

3. $10y - 7y - y$ ______

4. $4 + 6c + 10$ ______

5. $1 + 5 - 11z$ ______

6. $m + 2m + 5 + 10m$ ______

7. $2x + x + 4x - x$ ______

8. $20 - t - 5 + 5t$ ______

9. $20d + 25 - 8d$ ______

10. Simplify: $2 + 4x + 10y - 3x + 5 - 1 + 2y + 6x - 3y$

______

______