2.4 Developing Rules to Divide Integers

At Home At School

Quick Review

- For any multiplication of 2 different factors, there are 2 related division facts:
  For $4 \times 3 = 12$, the related division facts are: $12 \div 3 = 4$ and $12 \div 4 = 3$

  The same rules apply to the product of 2 integers.
  For $(-2)(+5) = -10$, the related division facts are:

  $(-10) \div (-2) = +5$ and $(-10) \div (+5) = -2$

  dividend divisor quotient
- The quotient of 2 integers with the same sign is positive.
  $(+10) \div (+2) = +5$ $(-10) \div (-2) = +5$
- The quotient of 2 integers with different signs is negative.
  $(+10) \div (-2) = -5$ $(-10) \div (+2) = -5$
- A division expression can be written using a division sign, $(-24) \div (-6)$, or it can be written as a fraction, $\frac{(-24)}{(-6)}$.

Practice

1. For each product, complete the 2 related division facts and name the sign of the quotient.

Multiplication Fact	Related Division Facts	Sign of Quotient
$(+2)(+3) = +6$	$(+6) \div (+2) =$ _____	_____
	$(+6) \div (+3) =$ _____	_____
$(-2)(-3) = +6$	$(+6) \div (-2) =$ _____	_____
	$(+6) \div (-3) =$ _____	_____
$(+2)(-3) = -6$	$(-6) \div (+2) =$ _____	_____
	$(-6) \div (-3) =$ _____	_____
$(-2)(+3) = -6$	$(-6) \div (-2) =$ _____	_____
	$(-6) \div (+3) =$ _____	_____

2.4 Rules to Divide Integers

Name _____

Blk F 2-3 L

Review

+ + − −	⊕
+ − − +	⊖

1) do 2 #'s at a time
2) assign ⊕ or ⊖
3) do math
4) double check your sign

− + | − + | ⊖
− + | − − | ⊕

New

$(-8) \div (-4) = \frac{-8}{-4} = \frac{(-8)}{(-4)} = -4\overline{)-8}$

− − | ⊕ $8 \div 4 = ⊕2$

$12 \div (-3)(2) = 12 \div (-3) \times (2)$

+ − | − + | ⊖ $= ⊖8$

division and multiplication are equal operations meaning you do them in order, as they occurs; L→R

$\frac{-9}{3} = -9 \div 3$ − + | ⊖ = ⊖3

* solve the numerator then solve the denominator the divide num ÷ den

$\frac{(-15)2}{6 \cdot 2}$

$\frac{- + | ⊖}{+ + | ⊕} = \frac{-30}{+12}$ − + | ⊖ $2\frac{1}{2}$

A. Find the product.

1. $1 \times (-19)$ -19
2. $(-6) \times (-15)$ 90
3. $(-23) \times 0$ 0
4. $(-25) \times (-25)$ 625
5. $(-13) \times 11$ -141
6. $24 \times (-2)$ -48
7. $36 \times (-10)$ -360
8. 15×18 270
9. $(-14) \times (-6)$ 84
10. $5 \times (-23)$ -115
11. $(-12) \times 60$ -720
12. $(-7) \times (-32)$ 224
13. $22(9)$ 198
14. $7(-50)$ -350
15. $(-234)0$ 0
16. $210(-5)$ ~~-1050~~ -1050
17. $(-140)(-3)$ 420
18. $(-600)12$ -7200
19. $128(-1)$ -128
20. $(-150)(-10)$ 1500
21. a. $(-1)(-1)$ 1
b. $(-1)(-1)(-1)$ -1
c. $(-1)(-1)(-1)(-1)$ 1
d. $(-1)(-1)(-1)(-1)(-1)$ -1
22. a. $(-2)(-2)$ 4
$(-2)^3$ b. $(-2)(-2)(-2)$ -8
c. $(-2)(-2)(-2)(-2)$ 16
d. $(-2)(-2)(-2)(-2)(-2)$ -32
23. a. $(-1)^2$ 1
b. $(-1)^3$ -1
c. $(-1)^4$ 1
d. $(-1)^5$ -1
24. a. $(-2)^2$ 4
b. $(-2)^3$ -8
c. $(-2)^4$ 16
d. $(-2)^5$ -32

B Find the quotient.

13. $14 \div 7$ 2
14. $28 \div 14$ 2
15. $(-10) \div 10$ -1
16. $(-70) \div (-5)$ 14
17. $0 \div (-5)$ 0
18. $150 \div (-5)$ -30
19. $(-75) \div 15$ -6
20. $(-99) \div (-3)$ 33
$(-8) \div (-1)$ 8
22. $(-48) \div 2$ -24
23. $125 \div 25$ 5
24. $40 \div (-8)$ -5
25. $\frac{-96}{-8}$ 12
26. $\frac{100}{-20}$ -5
27. $\frac{-64}{16}$ -4
28. $\frac{57}{-3}$ -19
29. $\frac{-81}{9}$ -9
30. $\frac{-80}{-4}$ 20
31. $\frac{63}{-7}$ -9
32. $\frac{-89}{-89}$ 1
33. $\frac{0}{52}$ 0
34. $\frac{-127}{-1}$ 1
35. $\frac{-105}{3}$ -35
36. $\frac{120}{15}$ 8

A. Divide.

1. $(-35) \div 7$ -5
2. $(-128) \div (-8)$ 16
3. $0 \div (-83)$ 0
4. $(-44) \div 1$ -44
5. $72 \div (-6)$ -12
6. $120 \div (-2)$ -60
7. $(-71) \div (-71)$ 1
8. $160 \div (-80)$ -2
9. $143 \div 11$ 13
10. $(-380) \div 10$ -38
11. $(-105) \div (-15)$ 7
12. $144 \div (-12)$ -12
13. $\frac{-175}{25}$ -7
14. $\frac{16}{-1}$ -16
15. $\frac{-70}{-14}$ 5
16. $\frac{-90}{3}$ -30
17. $\frac{82}{-41}$ -2
18. $\frac{-144}{-8}$ 18
19. $\frac{-240}{16}$ -15
20. $\frac{0}{-19}$ 0
21. $\frac{133}{-7}$ -19
22. $\frac{-108}{-9}$ 12
23. $\frac{192}{12}$ 16
24. $\frac{-225}{25}$ -9

C Simplify. → Do Math

25. $\frac{(-7) - 9}{-4}$ -15 r 3
26. $\frac{5 \times (-5)}{5}$ -5
27. $\frac{(-15)3}{(5)1}$ -9
28. $\frac{(-5) - (-10)}{(-3) + 4}$ 5
29. $\frac{8 - (-10)}{(-3)^2}$ $\frac{18}{9} = 2$
30. $\frac{-18}{6} + \frac{-12}{4}$ $-3 + (-3) = -6$
31. $(-6) + 4 \div (-4)$ $\frac{1}{2}$
32. $(-25) \div ((-3) + (-2))$ 5
33. $\frac{(-4) + 9 \times (-2)}{7 + (-8) - (-12)}$ $\frac{10}{11}$

C Evaluate the expression. Suppose $a = -48$, $b = 8$, and $c = -2$.

34. $a \div b$ -6
35. $\frac{b}{c}$ -4
36. $a \div c$ 24
37. $a \div (b \div 4)$ 12
38. $\frac{ac}{b}$ 12
39. $\frac{a + b}{c}$ 28
40. $\frac{a \div c}{b}$ 3
41. abc 768
42. $a^2 + (bc)^2$ ~~2048~~ 2560

C Copy and complete each table.

43. Rule: $y = \frac{x}{-6}$

x	y
-42	7
0	0
336	-56
-270	45
6	-1
-90	15

44. Rule: $y = 3x \div 3$

x	y
-12	-12
4	4
0	0
-8	-8
-15	-15
20	20

45. Rule: $y = \frac{-60}{x}$

x	y
-6	10
15	-4
-4	15
-30	2
1	-60
-5	12

B. Find the product.

6. 8×3 24
7. $8 \times (-3)$ -24
8. $(-3) \times 8$ -24
9. $(-8) \times (-3)$ 24
10. 4×10 40
11. $4 \times (-5)$ -20
12. $(-4) \times 5$ -20
13. $(-4) \times (-5)$ 20
14. $6(12)$ 72
15. $6(-12)$ -72
16. $(-6)12$ -72
17. $(-6)(-12)$ 72
18. $15(10)$ 150
19. $15(-10)$ -150
20. $(-15)10$ -150
21. $(-15)(-10)$ 150
22. $12 \times (-7)$ 84
23. $(-12) \times (-7)$ 84
24. $(-1) \times (-89)$ 89
25. 1×89 89
26. 0×56 0
27. $0 \times (-56)$ 0
28. $(-6) \times 18$ -108
29. $(-6) \times (-18)$ 108
30. $9(8)$ 72
31. $9(-8)$ -72
32. $(-4)(-11)$ 44
33. $(-4)11$ -44
34. $(-13)0$ 0
35. $(13)0$ 0
36. $(9)(15)$ 135
37. $(-9)(-15)$ 135
38. $4 \times 5 \times (-10)$ -200
39. $12 \times (-2) \times 5$ -120
40. $8 \times (-3) \times (-6)$ 144
41. $(-5) \times (-2) \times (-18)$ -180
42. $(-3) \times (-10) \times 9$ 270
43. $(-25) \times (-4) \times (-30)$ 3000
44. $6(2)(-5)$ -60
45. $(-2)(-3)(-4)$ -24
46. $(-6)(9)0$ 0
47. $(-3)(-5)(-1)(-2)$ 30
48. $(7)(-10)(-3)(4)$ 840
49. $(-5)(-3)(-8)(-10)$ 1200