

9. [Integer \times, \div]

Skill 9.1 Multiplying integers.

MM5.2 1 2 3 4
MM6.1 1 2 3 4

- Multiply the integers ignoring the signs.
- Determine the sign of the result using the multiplication rules.

Multiplication Rules

same signs: positive \times positive = positive
negative \times negative = positive

Multiplication Rules

different signs: positive \times negative = negative
negative \times positive = negative

Example: $-9 \times (-3)$
= 27 - - + +

Example: $9 \times (-3)$
 $+9 \times (-3)$
= -27 + - - -

Q. $(+2) \times (-9) =$

A. $(+2) \times (-9)$
= 2×-9 + x - = -
= **-18**

a) $(-3) \times (+8) =$ - x + = -
= -3×8 = -24

b) $(-3) \times (-4) =$

c) $(+5) \times (-9) =$

d) $(-10) \times (+10) =$

e) $(-2) \times (+6) =$

f) $(-4) \times (-7) =$

g) $(+7) \times (-3) =$

h) $(+4) \times (-5) =$

i) $(+8) \times (+8) =$

j) $(+2) \times (-17) =$

k) $(-3) \times (-15) =$

l) $-21 \times -2 =$

m) $(-5) \times (-2) \times (+7) =$
= $5 \times 2 \times 7$ - x - = +
= 10×7 = 70

n) $(+3) \times (-4) \times (-2) =$
=

o) $(-5) \times (+3) \times (+3) =$
=

p) $(-4) \times (+4) \times (-2) =$
=

q) $(-6) \times (-6) \times (-10) =$
=

r) $20 \times -5 \times 3 =$
=

Skill 9.2 Dividing integers.

MM5.2 1 1 2 2 3 4 4
MM6.1 1 1 2 2 3 3 4 4

- Divide the integers ignoring the signs.
- Determine the sign of the result using the division rules.

Division Rules

same signs: positive \div positive = positive
negative \div negative = positive

Division Rules

different signs: positive \div negative = negative
negative \div positive = negative

Example: $-9 \div (-3) = 3$

(Note: A callout bubble points to the -3 in the denominator with the sign rule $- \div - = +$)

Example: $9 \div (-3) = -3$

(Note: A callout bubble points to the -3 in the denominator with the sign rule $+ \div - = -$)

Q. $(+12) \div (-3) =$

A. $(+12) \div (-3) = 12 \div -3 = -4$

(Note: A callout bubble points to the -3 in the denominator with the sign rule $+ \div - = -$)

a) $(-18) \div (+9) = -18 \div 9 = -2$

(Note: A callout bubble points to the -18 and $+9$ with the sign rule $- \div + = -$)

b) $(-6) \div (+1) =$

c) $(+12) \div (-4) =$

d) $(-15) \div (-3) =$

e) $(-24) \div (+6) =$

f) $(+9) \div (+9) =$

g) $(+35) \div (-5) =$

h) $(-27) \div (+3) =$

i) $(-28) \div (-7) =$

j) $\frac{32}{-4} = 32 \div -4 = -8$

(Note: A callout bubble points to the fraction with the word "division")

k) $\frac{-15}{-3} =$

l) $\frac{-42}{7} =$

m) $\frac{24}{-6} =$

n) $\frac{-18}{-2} =$

o) $\frac{-40}{5} =$

p) $\frac{56}{-4} =$

q) $\frac{-36}{-9} =$

r) $\frac{-75}{15} =$

s) $\frac{80}{-8} =$

t) $\frac{-64}{-8} =$

u) $\frac{-84}{12} =$

Skill 9.3 Multiplying integers involving powers of 10.

MM5.2 1 1 2 2 3 3 4 4
MM6.1 1 1 2 2 3 3 4 4

- Multiply the integers ignoring the signs.
- Determine the sign of the result using the multiplication rules.

Multiplication Rules

same signs: positive \times positive = positive
negative \times negative = positive

Multiplication Rules

different signs: positive \times negative = negative
negative \times positive = negative

Example: $-9 \times (-3)$
= 27

- - - +

Example: $9 \times (-3)$
 $+9 \times (-3)$
= -27

+ - - -

- Consider the zeros as making groups of 10's or 100's and place them last.
(see skill 1.3, page 4)

Q. $(+200) \times (-2) =$

A. $(+200) \times (-2)$
= 200×-2
= **-400**

+ x - = -

a) $(-3) \times (+100) =$
= -3×100 = **-300**

- x + = -

b) $(-20) \times (-4) =$
= =

c) $(+50) \times (-2) =$
= =

d) $(-4) \times (-100) =$
= =

e) $(+100) \times (-8) =$
= =

f) $(-700) \times (+6) =$
= =

g) $(-100) \times (+10) =$
= =

h) $(+20) \times (+100) =$
= =

i) $(-10) \times (-40) =$
= =

j) $(+300) \times (-3) =$
= =

k) $(+80) \times (-10) =$
= =

l) $(+4) \times (+300) =$
= =

m) $(+600) \times (-1) =$
= =

n) $(-40) \times (-50) =$
= =

o) $(-500) \times (-3) =$
= =

p) $(+6) \times (-200) =$
= =

q) $(-300) \times (-5) =$
= =

r) $(-700) \times (-7) =$
= =

Skill 9.4 Multiplying and dividing integers.

MM5.2 11 22 33 44
MM6.1 11 22 33 44

- Multiply and/or divide from left to right. (see skills 9.1, page 93 and 9.2, page 94)
- When multiplying and dividing integers use the multiplication and division rules. (see skills 9.1, page 93 and 9.2, page 94)

Q. $(+10) \div (-2) \times (-7) =$ **A.** $(+10) \div (-2) \times (-7) =$

$= 10 \div -2 \times -7$ *work from left to right*

$= -5 \times -7$

$= 35$

a) $(-4) \times (+5) \div (+5) =$ **b)** $(+10) \times (-3) \div (-5) =$ **c)** $(+15) \div (+3) \times (-3) =$

$= -4 \times 5 \div 5$ $=$ $=$

$= -20 \div 5 = \boxed{-4}$ $=$ $=$

d) $(-8) \times (-2) \div (+4) =$ **e)** $(+24) \div (-6) \times (-2) =$ **f)** $(-5) \times (-4) \div (-10) =$

$=$ $=$ $=$

$=$ $=$ $=$

g) $(+30) \div (-10) \times (+3) =$ **h)** $(+28) \div (-14) \times (-7) =$ **i)** $(-2) \times (-150) \div (+20) =$

$=$ $=$ $=$

$=$ $=$ $=$

j) $(+7) \times (+6) \div (-21) =$ **k)** $(-2) \times (+32) \div (+8) =$ **l)** $(-35) \div (-7) \times (+9) =$

$=$ $=$ $=$

$=$ $=$ $=$

m) $10 \times 3 \div -5 =$ **n)** $24 \div -4 \times -4 =$ **o)** $-6 \times 8 \div -12 =$

$=$ $=$ $=$

$=$ $=$ $=$

p) $8 \times -4 \times -5 =$ **q)** $-4 \times 5 \div -10 =$ **r)** $-6 \times 9 \div -3 =$

$=$ $=$ $=$

$=$ $=$ $=$

s) $30 \div -5 \times -2 =$ **t)** $-44 \div 11 \times 12 =$ **u)** $45 \div -9 \times -4 =$

$=$ $=$ $=$

$=$ $=$ $=$

Skill 9.5 Multiplying and dividing integers using order of operations.

MM5.2 1 1 2 2 3 3 4 4
MM6.1 1 1 2 2 3 3 4 4

- Complete the operations in the correct order.
 - Simplify within brackets.
 - Multiply or divide the results.
- When multiplying and dividing integers use the multiplication and division rules. (see skills 9.1, page 93 and 9.2, page 94)

Q. $(6 + 4) \times (-6 - 4) =$ **A.** $(6 + 4) \times (-6 - 4)$ *brackets first*
 $= 10 \times -10$
 $= -100$ *+ x - = -*

a) $(3 + 3) \times (-4 + 9) =$ **b)** $(2 + 4) \times (-6 + 4) =$ **c)** $(8 - 4) \times (6 - 9) =$
 $= 6 \times 5 = \boxed{30}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

d) $(7 - 4) \times (-8 + 3) =$ **e)** $(1 - 8) \times (4 - 5) =$ **f)** $(5 + 3) \times (3 - 5) =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

g) $(-3 - 1) \times (-3 + 5) =$ **h)** $(6 + 6) \times (-2 + 8) =$ **i)** $(8 - 5) \times (5 - 8) =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

j) $(-1 - 7) \times (3 - 9) =$ **k)** $(5 + 4) \times (-5 - 4) =$ **l)** $(-4 - 3) \times (-1 + 4) =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

m) $(-5 + 2) \times (-6 + 9) =$ **n)** $(2 - 8) \times (-1 + 2) =$ **o)** $(5 - 1) \times (-3 - 2) =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

p) $\frac{7 - 1}{2 - 5} =$ *division*
 $= \frac{6}{-3}$
 $= 6 \div -3 = \boxed{}$ **q)** $\frac{5 - 8}{-5 + 8} =$ **r)** $\frac{-40}{-2 \times 5} =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

s) $\frac{8 - 2}{2 - 5} =$ **t)** $\frac{2 - 9}{-2 + 9} =$ **u)** $\frac{36}{-3 \times 4} =$
 $= \dots = \boxed{}$ $= \dots = \boxed{}$ $= \dots = \boxed{}$

To find a missing integer using multiplication

- Circle the integer, including its sign, that is on the side of the unknown.
- Use division, the inverse operation of multiplication, to remove the circled integer from the side of the unknown.
Hint: e.g. $\times -6$ and $\div -6$ will cancel leaving 1.
- Perform the same operation on the other side of the equation.

To find a missing integer using division

When dividing a number by an unknown -

- Divide the number by the result to determine the unknown.
- OR When dividing an unknown by a number
- Circle the integer, including its sign, that is on the side of the unknown.
 - Use multiplication, the inverse operation of division to remove the circled integer from the side of the unknown.
Hint: e.g. $\div -6$ and $\times -6$ will cancel leaving 1.
 - Perform the same operation on the other side of the equation.

Q. $-96 \div \boxed{} = 8$

A. $-96 \div x = 8$

OR

A. $-96 \div x \times x = 8 \times x$

$-96 \div 8 = x$ *÷ by result*
 $-96 \div 8 = -12$
 $x = -12$

$-96 = 8x$
 $\frac{8x}{8} = \frac{-96}{8} \div 8$
 $x = -12$

a) $\boxed{-5} \times \textcircled{-7} = 35$

$x \times \cancel{-7} \div \cancel{-7} = 35 \div -7$
 $x = -5$

b) $54 \div \boxed{} = -9$

$54 \div -9 =$

c) $\boxed{} \div \textcircled{3} = -7$

$x \div \cancel{3} \times \cancel{3} = -7 \times 3$

d) $\boxed{} \times \textcircled{-2} = -10$

e) $-7 \times \boxed{} = 63$

f) $-48 \div \boxed{} = -6$

g) $\boxed{} \times -12 = -120$

h) $\boxed{} \div -6 = 11$

i) $\boxed{} \times 8 = -24$

j) $-6 \times \boxed{} = 54$

k) $-121 \div \boxed{} = -11$

l) $\boxed{} \div 8 = -7$

m) $-8 \times \boxed{} = 72$

n) $-450 \div \boxed{} = 30$

o) $\boxed{} \div -6 = 7$