

9. [Integers \times, \div]

Skill 9.1 Multiplying integers.

MM9 1 2 3 4
MM10 1 2 3 4

- Multiply the signs first, then multiply the numbers.
- When multiplying integers use these rules for the signs:

If same: $+\times+=+$
 $-\times- = +$

If different: $+\times- = -$
 $-\times+ = -$

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

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

Hint: When multiplying more than 2 integers, you can start with any pair that makes the multiplication easier.

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

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

a) $(-3) \times (+8) =$ $-\times+ = -$
 $= -3 \times 8$ $=$

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) $(-5) \times (-2) \times (+7) =$
 $-\times- = +$
 $= 5 \times 2 \times 7$
 $= 10 \times 7$ $=$

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

- Divide the signs first, then divide the numbers.
- When dividing integers use these rules for the signs:

If same: $+\div+=+$
 $-\div- = +$

If different: $+\div- = -$
 $-\div+ = -$

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

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

Hint: Fractions are divisions. Divide the numerator (top) by the denominator (bottom).

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

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

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

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

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

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

m) $\frac{7-1}{2-5} = \frac{6}{-3} = 6 \div -3 =$
(division)

n) $\frac{5-8}{-5+8} =$

o) $\frac{-40}{-2 \times 5} =$

p) $\frac{8-2}{2-5} =$

q) $\frac{2-9}{-2+9} =$

r) $\frac{36}{-3 \times 8} =$

Skill 9.3 Multiplying integers involving powers of 10.

- Multiply the signs first, then multiply the numbers.
- When multiplying integers use these rules for the signs:

If same: $+ \times + = +$
 $- \times - = +$

If different: $+ \times - = -$
 $- \times + = -$

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

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

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

a) $(-3) \times (+100) = -3 \times 100 = -100$ $- \times + = -$ **b)** $(-20) \times (-4) =$ **c)** $(+50) \times (-2) =$

d) $(-100) \times (+10) =$ **e)** $(+20) \times (+100) =$ **f)** $(-10) \times (-40) =$

g) $(+300) \times (-3) =$ **h)** $(+80) \times (-10) =$ **i)** $(+4) \times (+300) =$

j) $(+600) \times (-1) =$ **k)** $(-40) \times (-50) =$ **l)** $(-500) \times (-3) =$

m) $(+6) \times (-200) =$ **n)** $(-300) \times (-5) =$ **o)** $(-700) \times (-7) =$

Skill 9.4 Multiplying and dividing integers.

MM9 11 22 33 44
MM10 11 22 33 44

- Multiply and/or divide from left to right. (see skills 9.1, page 85 and 9.2, page 86)
- When multiplying and dividing integers use these rules for the signs:

If same: $+\times+=+$ $+\div+=+$
 $-\times- = +$ $-\div- = +$

If different: $+\times- = -$ $+\div- = -$
 $-\times+ = -$ $-\div+ = -$

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

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

$= 10 \div -2 \times -7$ — *work from left to right*
 $= -5 \times -7$
 $= 35$ — *-x- = +*

a) $(-4) \times (+5) \div (+5) =$

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

b) $(+10) \times (-3) \div (-5) =$

$=$
 $=$ $\boxed{}$

c) $(+15) \div (+3) \times (-3) =$

$=$
 $=$ $\boxed{}$

d) $(-8) \times (-2) \div (+4) =$

$=$
 $=$ $\boxed{}$

e) $(+24) \div (-6) \times (-2) =$

$=$
 $=$ $\boxed{}$

f) $(-5) \times (-4) \div (-10) =$

$=$
 $=$ $\boxed{}$

g) $(+30) \div (-10) \times (+3) =$

$=$
 $=$ $\boxed{}$

h) $(+28) \div (-14) \times (-7) =$

$=$
 $=$ $\boxed{}$

i) $(-2) \times (-150) \div (+20) =$

$=$
 $=$ $\boxed{}$

j) $(+7) \times (+6) \div (-21) =$

$=$
 $=$ $\boxed{}$

k) $(-2) \times (+32) \div (+8) =$

$=$
 $=$ $\boxed{}$

l) $(-35) \div (-7) \times (+9) =$

$=$
 $=$ $\boxed{}$

m) $10 \times 3 \div -5 =$

$=$ $\boxed{}$

n) $24 \div -4 \times -4 =$

$=$ $\boxed{}$

o) $-6 \times 8 \div -12 =$

$=$ $\boxed{}$

Skill 9.5 Multiplying integers using order of operations.

MM9 11 22 33 44
MM10 11 22 33 44

- Complete the operations in the correct order.
 - Simplify within brackets.
 - Multiply the results.
- When multiplying integers use these rules for the signs:

If same: $+\times+=+$
 $-\times- = +$

If different: $+\times- = -$
 $-\times+ = -$

Q. $(6 + 4) \times (-6 - 4) =$

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

a) $(3 + 3) \times (-4 + 9) =$

$= 6 \times 5 = \boxed{30}$

b) $(2 + 4) \times (-6 + 4) =$

$= \dots = \boxed{}$

c) $(8 - 4) \times (6 - 9) =$

$= \dots = \boxed{}$

d) $(7 - 4) \times (-8 + 3) =$

$= \dots = \boxed{}$

e) $(1 - 8) \times (4 - 5) =$

$= \dots = \boxed{}$

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

$= \dots = \boxed{}$

g) $(-3 - 1) \times (-3 + 5) =$

$= \dots = \boxed{}$

h) $(6 + 6) \times (-2 + 8) =$

$= \dots = \boxed{}$

i) $(8 - 5) \times (5 - 8) =$

$= \dots = \boxed{}$

j) $(-1 - 7) \times (3 - 9) =$

$= \dots = \boxed{}$

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

$= \dots = \boxed{}$

l) $(-4 - 3) \times (-1 + 4) =$

$= \dots = \boxed{}$

m) $(-4 - 7) \times (-3 + 8) =$

$= \dots = \boxed{}$

n) $(3 - 7) \times (-7 - 3) =$

$= \dots = \boxed{}$

o) $(-9 + 2) \times (7 + 5) =$

$= \dots = \boxed{}$

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.

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. $-96 \div x = 8$

$-96 \div 8 = x$ *÷ by result*

$-96 \div 8 = -12$

$x = -12$

OR

A. $-96 \cancel{\div x} \times \cancel{x} = 8 \times x$

$-96 = 8x$

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

$x = -12$

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