

# 8. [Integers]

## Skill 8.1 Adding integers.

**To add two integers with the same sign:**

- Add their absolute values.
- Use the plus sign if both integers are positive.
- Use the minus sign if both integers are negative.

Examples:  $-9 + (-3)$  *add, use “-”*  
 $= -12$   
 $9 + 3$  *add, use “+”*  
 $= 12$

**To add two integers with different signs:**

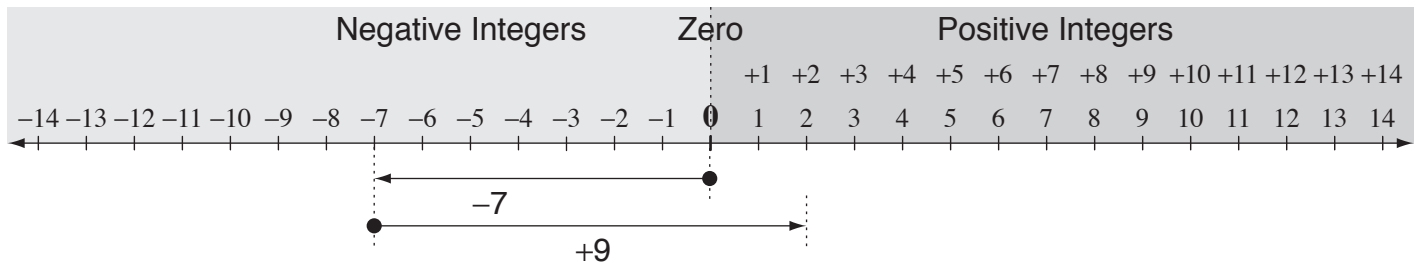
- Subtract their absolute values.
- Use the plus sign if the positive integer’s absolute value is greater.
- Use the minus sign if the negative integer’s absolute value is greater.

Examples:  $-9 + 3$  *subtract, use “-”*  
 $= -6$   
 $9 + (-3)$  *subtract, use “+”*  
 $= 6$

*Hint: Every number has a sign attached to it, so if there is no sign, the number is positive.*

- The sign can also be visualized using a number line.

*Hint: ‘-’ means move left or backwards and ‘+’ means move right or forwards.*



<b>Q.</b> $-7 + 9 =$ <i>start at -7, move forward 9</i>	<b>A.</b> $-7 + 9 = 2$	Subtract $ -7 $ from $ 9 $ $9 - 7 = 2$ The sum is positive because $ 9  \geq  -7 $
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<b>a)</b> $5 + (-7) =$ <span style="border: 1px solid black; padding: 2px 10px;">-2</span> <i>subtract, use “-”</i>	<b>b)</b> $-4 + (-8) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span> <i>add, use “-”</i>	<b>c)</b> $-5 + (-3) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>
<b>d)</b> $2 + (-8) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>e)</b> $-4 + (-6) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>f)</b> $-7 + 4 =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>
<b>g)</b> $-3 + 6 =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>h)</b> $5 + (-8) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>i)</b> $-2 + (-14) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>
<b>j)</b> $-16 + (-9) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>k)</b> $-15 + (-8) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>l)</b> $2 + 7 =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>
<b>m)</b> $7 + 15 =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>n)</b> $-17 + 9 =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>o)</b> $7 + (-13) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>
<b>p)</b> $12 + (-13) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>q)</b> $-11 + (-6) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>	<b>r)</b> $-16 + (-7) =$ <span style="border: 1px solid black; padding: 2px 10px;"> </span>

- Consider subtracting an integer as adding its opposite. (see skills 8.1, page 85)

**To subtract a positive integer:**

Examples:  $-9 - 3$  *subtract 3 means add -3*  
 $= -9 + (-3)$  *add, use "-"*  
 $= -12$   
 $9 - 3$   
 $= 9 + (-3)$  *subtract, use "+"*  
 $= 6$

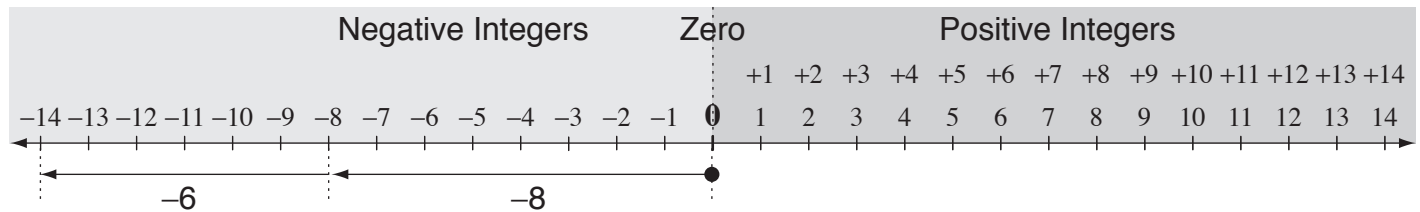
**To subtract a negative integer:**

Examples:  $-9 - (-3)$  *subtract -3 means add 3*  
 $= -9 + 3$  *subtract, use "-"*  
 $= -6$   
 $9 - (-3)$   
 $= 9 + 3$  *add, use "+"*  
 $= 12$

*Hint: Every number has a sign attached to it, so if there is no sign, the number is positive.*

- The sign of the result of the subtraction can also be visualised using a number line.

*Hint: '-' means move left or backwards and '+' means move right or forwards.*



**Q.**  $-8 - 6 =$

*start at -8, move backward 6*

**A.**  $-8 - 6$

$= -8 + (-6)$   
 $= -14$

Subtract 6 means add -6

Add their absolute values.  $|-8| + |-6| = 14$   
 Use the minus sign.

**a)**  $-5 - (-6) =$  *subtract -6 means add 6*  
 $= -5 + 6 = \boxed{1}$

**b)**  $3 - 9 =$  *subtract 9 means add -9*  
 $= 3 + (-9) = \boxed{\phantom{00}}$  *subtract, use "-"*

**c)**  $7 - 8 =$   
 $= \dots = \boxed{\phantom{00}}$

**d)**  $7 - (-7) =$   
 $= \dots = \boxed{\phantom{00}}$

**e)**  $-3 - (-2) =$   
 $= \dots = \boxed{\phantom{00}}$

**f)**  $-4 - (-8) =$   
 $= \dots = \boxed{\phantom{00}}$

**g)**  $6 - (-7) =$   
 $= \dots = \boxed{\phantom{00}}$

**h)**  $4 - (-9) =$   
 $= \dots = \boxed{\phantom{00}}$

**i)**  $-19 - 11 =$   
 $= \dots = \boxed{\phantom{00}}$

**j)**  $-16 - 9 =$   
 $= \dots = \boxed{\phantom{00}}$

**k)**  $-12 - (-15) =$   
 $= \dots = \boxed{\phantom{00}}$

**l)**  $-6 - (-3) =$   
 $= \dots = \boxed{\phantom{00}}$

**m)**  $4 - 16 =$   
 $= \dots = \boxed{\phantom{00}}$

**n)**  $-11 - 13 =$   
 $= \dots = \boxed{\phantom{00}}$

**o)**  $6 - (-14) =$   
 $= \dots = \boxed{\phantom{00}}$

# Skill 8.3 Multiplying integers.

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

If same:  $++ = +$   
 $-- = +$

If different:  $+- = -$   
 $-+ = -$

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

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

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

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

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

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

$-24$

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

$= 10 \times 7 = 70$

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

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

If same:  $++ = +$   
 $-- = +$

If different:  $+- = -$   
 $-+ = -$

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

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

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

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

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

a)  $-18 \div 9 =$        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)  $-108 \div 9 \div 3 =$    
 = ..... =

k)  $-28 \div (-2) \div 2 =$    
 = ..... =

l)  $132 \div (-3) \div 4 =$    
 = ..... =

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

n)  $\frac{-15}{-3} =$    
 = ..... =

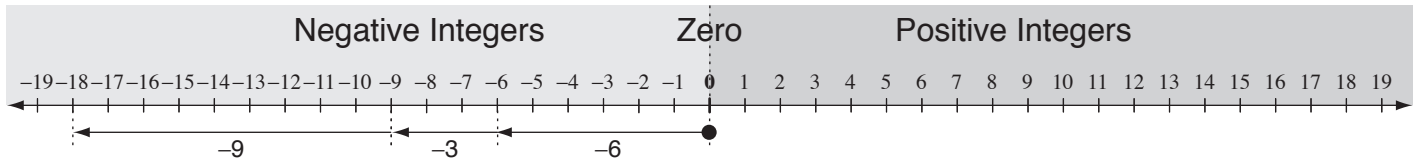
o)  $\frac{-42}{7} =$    
 = ..... =

p)  $\frac{35}{-5} =$    
 = ..... =

q)  $\frac{-30}{-6} =$    
 = ..... =

r)  $\frac{-72}{9} =$    
 = ..... =

- Add and/or subtract from left to right. (see skills 8.1, page 85 and 8.2, page 86)
- The sign of the result can also be visualized using a number line.



**Q.**  $-6 - 3 - 9 =$

**A.**  $-6 - 3 - 9$  *make subtraction an addition*  
 $= -6 + (-3) + (-9)$  *work from left to right*  
 $= -9 + (-9)$  *start at -9, move backward 9 more*  
 $= -18$

*add, use “+”*

**a)**  $-5 + (-6) + 9 =$

$= -11 + 9 = \boxed{-2}$

*subtract, use “-”*

**b)**  $1 - (-7) - (-7) =$

$= 1 +$   
 $= \dots = \boxed{\phantom{00}}$

**c)**  $9 + (-6) - (-2) =$

$= \dots = \boxed{\phantom{00}}$

**d)**  $-8 - (-5) + 4 =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**e)**  $-2 + (-6) - (-9) =$

$= \dots = \boxed{\phantom{00}}$

**f)**  $5 - 7 - (-8) =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**g)**  $3 - (-6) + (-8) =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**h)**  $5 + (-4) - 3 =$

$= \dots = \boxed{\phantom{00}}$

**i)**  $-2 - (-6) - 7 =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**j)**  $8 - 2 - (-7) =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**k)**  $-12 - (-13) + 15 =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**l)**  $-14 - 16 + 18 =$

$= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**m)**  $7 + 15 + (-19) =$

$= \dots = \boxed{\phantom{00}}$

**n)**  $5 + (-7) + (-9) =$

$= \dots = \boxed{\phantom{00}}$

**o)**  $-6 + 5 + (-8) =$

$= \dots = \boxed{\phantom{00}}$

## Skill 8.6 Multiplying and dividing integers.

- Multiply and/or divide from left to right. (see skills 8.3, page 87 and 8.4, page 88)
- When multiplying and dividing integers use these rules for the signs:

If same:  $++ = +$   
 $-- = +$

If different:  $+- = -$   
 $-+ = -$

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

**A.**  $10 \div (-2) \times (-7)$  — *work from left to right*  
 $\overset{+-=-}{=} -5 \times (-7)$  —  $\overset{-+=+}{=} 35$   
 $= 35$

**a)**  $-4 \times 5 \div 5 =$

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

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**e)**  $24 \div (-6) \div (-2) =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**g)**  $30 \div (-10) \div 3 =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**k)**  $-2 \times 32 \div 8 =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

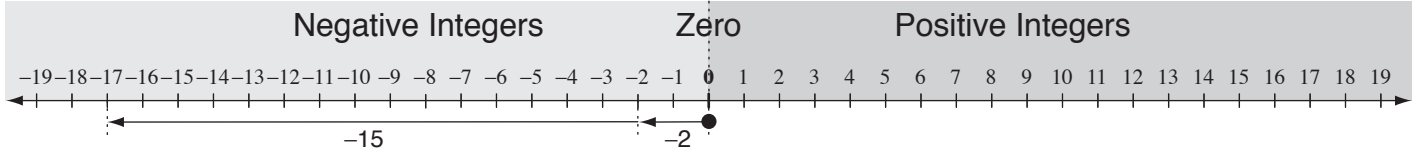
**n)**  $24 \div (-4) \times (-4) =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

- Complete the operations in the correct order.
  1. Simplify within brackets.
  2. Add and/or subtract from left to right.
- Consider adding integer rules. (see skill 8.1, page 85)
- Consider subtracting an integer as adding its opposite. (see skills 8.1, page 85 and 8.2, page 86)
- The sign of the result can also be visualised using a number line.



**Q.**  $(5 - 7) - (6 + 9) =$

**A.**  $(5 - 7) - (6 + 9)$  — complete the brackets first  
 $= (-2) - (15)$   
 $= -2 - 15$  — start at -2, move backward 15 more  
 $= -17$

**a)**  $4 + (-6 + 3) =$  — brackets first  
 $= 4 + (-3)$  — subtract, use “-”  
 $= 4 - 3 = \boxed{1}$   
 — subtract, use “+”

**b)**  $2 + (4 - 9) =$   
 $= 2 + (-5)$   
 $= \dots = \boxed{\phantom{00}}$

**c)**  $7 + (3 - 8) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**d)**  $4 - (9 - 7) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**e)**  $5 - (-8 + 6) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**f)**  $6 + (-5 - 4) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**g)**  $(2 - 5) - (3 + 4) =$  — subtract 7 means add -7  
 $= -3 - 7$   
 $= -3 + (-7) = \boxed{\phantom{00}}$  — add, use “-”

**h)**  $(8 - 4) + (3 - 9) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**i)**  $(5 - 9) - (9 - 5) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**j)**  $(5 + 6) - (4 - 11) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**k)**  $(3 - 8) + (9 - 14) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

**l)**  $(-8 - 6) - (7 - 13) =$   
 $= \dots$   
 $= \dots = \boxed{\phantom{00}}$

- Complete the operations in the correct order.
  - Simplify within brackets.
  - Multiply and/or divide from left to right.
- When multiplying or dividing integers use these rules for the signs:

If same:  $++ = +$   
 $-- = +$

If different:  $+- = -$   
 $-+ = -$

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

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

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

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

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

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**d)**  $(-1 - 7) \times (3 - 9) =$

$= \dots = \boxed{\phantom{00}}$

**e)**  $(5 + 4) \times (-5 - 4) =$

$= \dots = \boxed{\phantom{00}}$

**f)**  $(-4 - 3) \times (-1 + 4) =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**h)**  $(3 - 7) \times (-7 - 3) =$

$= \dots = \boxed{\phantom{00}}$

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

$= \dots = \boxed{\phantom{00}}$

**j)**  $\frac{7-1}{2-5}$  *division*

$= \frac{6}{-3}$

$= 6 \div -3 = \boxed{\phantom{00}}$

**k)**  $\frac{5-8}{-5+8}$

$= \dots$

$= \dots = \boxed{\phantom{00}}$

**l)**  $\frac{-40}{-2 \times 5}$

$= \dots$

$= \dots = \boxed{\phantom{00}}$

**m)**  $\frac{8-2}{2-5}$

$= \dots$

$= \dots = \boxed{\phantom{00}}$

**n)**  $\frac{2-9}{-2+9}$

$= \dots$

$= \dots = \boxed{\phantom{00}}$

**o)**  $\frac{36}{-3 \times 8}$

$= \dots$

$= \dots = \boxed{\phantom{00}}$