Section 2.3: Order of Operations

Oct 21-6:06 PM

Review:

Adding Integers:

A. $(+5) + (+2) = (+7)$

B. $(-6) + (-4) = (-10)$

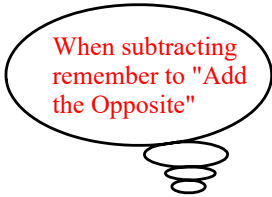C. $(-8) + (+2) = (-6)$

D. $(+9) + (-3) = (+6)$

Subtracting Integers:

A. $(+7) - (+3) = (+7) + (-3) = (+4)$

B. $(-6) - (-3) = (-6) + (+3) = (-3)$

C. $(-2) - (+9) = (-2) + (-9) = (-11)$

D. $(+3) - (-6) = (+3) + (+6) = (+9)$

When subtracting remember to "Add the Opposite"

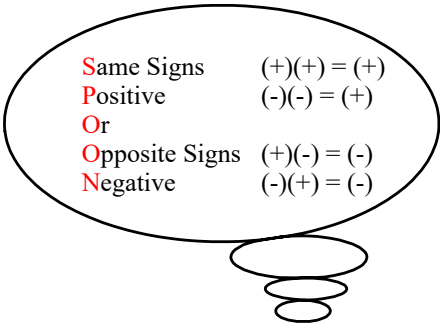Oct 21-6:08 PM

Multiplying Integers:

A. (+2)(+3) = (+6)

B. (-4)(-5) = (+20)

C. (+3)(-5) = (-15)

D. (-2)(+7) = (-14)

Same Signs   (+)(+) = (+)
Positive   (-)(-) = (+)
Or
Opposite Signs (+)(-) = (-)
Negative   (-)(+) = (-)

Dividing Integers:

A. (+10) ÷ (+2) = (+5)

B. (-45) ÷ (-5) = (+9)

C. (-121) ÷ (+11) = (-11)

D. (+64) ÷ (-8) = (-8)

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Order of Operations

B -   do operations in brackets first
E -   evaluate the powers
D }   divide or multiply in order from left to right
M }
A }   add or subtract in order from left to right
S }

Complete the following:

A. $2^3 + 1$

= (2)(2)(2) + 1

= 8 + 1

= 9

B. $8 - 3^2$ C. $(3 - 1)^3$

= 8 - (3)(3)   = $(2)^3$

= 8 - 9   = (2)(2)(2)

= 8 + (-9)   = 8

= -1

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Your turn...

D. $4^2 + 3$

$= (4)(4) + 3$

$= 16 + 3$

$= 19$

E. $(2 + 1)^2$

$= (3)^2$

$= (3)(3)$

$= 9$

F. $5^2 - 2^2$

$= (5)(5) - (2)(2)$

$= 25 - 4$

$= 21$

G. $(5 - 6)^2$

$= (-1)^2$

$= (-1)(-1)$

$= 1$

H. $5 + 3^2$

$= 5 + (3)(3)$

$= 5 + 9$

$= 14$

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I. $[2 \times (-2)^3]^2$

$= [2 \times (-2)(-2)(-2)]^2$

$= [2 \times (-8)]^2$

$= (-16)^2$

$= 256$

J. $(7^2 + 5^0) \div (-5)^1$

$= [(7)(7) + 1] \div (-5)^1$

$= (49 + 1) \div (-5)^1$

$= 50 \div (-5)$

$= -10$

K. $(3^2 + 6^0)^2 \div 2^1$

$= (9 + 1)^2 \div 2^1$

$= (10)^2 \div 2$

$= (10)(10) \div 2$

$= 100 \div 2$

$= 50$

L. $10^2 + (2 \times 2^2)^2$

$= 10^2 + [2 \times (2)(2)]^2$

$= 10^2 + (2 \times 4)^2$

$= 10^2 + (8)^2$

$= (10)(10) + (8)(8)$

$= 100 + 64$

$= 164$

M. 5×3^2

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

$= 5 \times 9$

$= 45$

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N. This student got the correct answer, but did not earn full marks. Find and explain the mistake the student made and solve.

$-(24 - 3 \times 4^2)^0 \div (-2)^3$
$= -(24 - 12^2)^0 \div (-8)$
$= -(24 - 144)^0 \div (-8)$
$= -(-120)^0 \div (-8)$
$= -1 \div (-8)$
$= \dfrac{1}{8}$

Student Error:

The mistake occurred at 4^2.
$4^2 = 16$ should have been done BEFORE 3 x 4

OR

The student could have realized that the entire bracket has the exponent zero, so it is 1.

Correct Solution:

$-(24 - 3 \times 4^2)^0 \div (-2)^3$

$= -(1) \div (-2)^3$

$= -1 \div (-8)$

$= \dfrac{1}{8}$

Practice Exercises: Pg. 66 #3-8, 10, 12 & 18

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