

# ORDER OF OPERATIONS, ALGEBRA AND "MEANING" PRACTICE QUIZ

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Great work Mr. J.!!

Victim: Mr. Solutions

1. Separate each of the following expressions into **terms**. Then **evaluate**. (Show all steps!)

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(a)  $-4^2 + (-4)^2 - 5(5 - 7(6)) + 5(-2)^3$

$= -16 + 16 - 5(5 - 42) + 5(-32)$

$= 0 - 5(-37) + (-160)$

$= 0 - (-185) - 160$

$= 0 + 185 - 160$

$= 25$

(b)  $1 - 9^2 + 5(-3)(-2)^5 + (-9)^2 - 5[1 - 2(6^2)]$

$= 1 - 81 + (-15)(-32) + 81 - 5[1 - 2(36)]$

$= -80 + 480 + 81 - 5(1 - 72)$

$= 481 - 5(-71)$

$= 481 - (-355)$

$= 481 + 355 = 836$

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(c)  $\frac{-2[14 - 3(-7)^2] - (-16)}{-6^2 + 3(-7)(-8) - 4(3 - 7)}$

$= \frac{-2[14 - 3(49)] + 16}{-36 + 168 - 4(-4)}$

$= \frac{-2(14 - 147) + 16}{132 - (-16)}$

$= \frac{-2(-133) + 16}{132 + 16}$

$= \frac{266 + 16}{148}$

$= \frac{282}{148} = \frac{141}{74}$

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(d)  $\frac{-(-4) - 2[-11 - 3(-7)^3]}{-7^2 - 4(-3 - 7) + 3(7)(-8)}$

$= \frac{4 - 2[-11 - 3(-343)]}{-49 - 4(-10) + (-168)}$

$= \frac{4 - 2[-11 - (-1029)]}{-49 - (-40) - 168}$

$= \frac{4 - 2(-11 + 1029)}{-49 + 40 - 168}$

$= \frac{4 - 2(1018)}{-9 - 168}$

$= \frac{4 - 2036}{-176} = \frac{-2032}{-176} = \frac{127}{11}$

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2. Interpret each of the following in terms of **gains** and **losses**. Then **simplify**. (Show all steps!)

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| Expression                   | Interpretation in Terms of Gains and Losses                                                    | Simplified Form of Expression | Answer     |
|------------------------------|------------------------------------------------------------------------------------------------|-------------------------------|------------|
| (a) $-x - (-3x)$             | A loss of 1 "x" followed by a gain of 3 "x's"                                                  | $-x + 3x$                     | $2x$       |
| (b) $-6a + (+12a)$           | A loss of 6 "a's", gain of 12 "a's"                                                            | $-6a + 12a$                   | $6a$       |
| (c) $-1y + (-46y)$           | A loss of 1 "y", loss of 46 "y's"                                                              | $-y - 46y$                    | $-47y$     |
| (d) $+18st^2 - (+41st^2)$    | A gain of 18 "st <sup>2</sup> 's", loss of 41 "st <sup>2</sup> 's"                             | $18st^2 - 41st^2$             | $-23st^2$  |
| (e) $48a^2b^3 - (-31a^2b^3)$ | A gain of 48 "a <sup>2</sup> b <sup>3</sup> 's", gain of 31 "a <sup>2</sup> b <sup>3</sup> 's" | $48a^2b^3 + 31a^2b^3$         | $79a^2b^3$ |
| (f) $-38xyz - 30xyz$         | A loss of 38 "xyz's", loss of 30 "xyz's"                                                       | $-38xyz - 30xyz$              | $-68xyz$   |
| (g) $-38xyz - 30xyz^2$       | A loss of 38 "xyz's", loss of 30 "xyz <sup>2</sup> 's"                                         | $-38xyz - 30xyz^2$            | C.B.S.     |

3. Interpret each expression in terms of groups. Then represent the expression with a diagram and evaluate.

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| Factored Expression | Interpretation in Terms of Groups | Diagram | Expanded Expression |
|---------------------|-----------------------------------|---------|---------------------|
| (a) $3(4x+2)$       | Three groups of $4x+2$            |         | $12x+6$             |
| (b) $3(x+y)$        | Three groups of $x+y$             |         | $3x+3y$             |
| (c) $-3(x+y)$       | -3 groups of $x+y$                |         | $-3x-3y$            |
| (d) $-2(2x-3y)$     | -2 groups of $2x-3y$              |         | $-4x+6y$            |

4. Simplify each expression fully. 17/17

$$\begin{aligned}
 \text{(a)} \quad & (-3ab - 5c) + (ab - c) \\
 & = -3ab - 5c + ab - c \\
 & = -3ab + ab - 5c - c \\
 & = -2ab - 6c
 \end{aligned}$$

$$\begin{aligned}
 \text{(b)} \quad & (-3ab - 5c) - (ab - c) \\
 & = -3ab - 5c + (-ab + c) \\
 & = -3ab - 5c - ab + c \\
 & = -3ab - ab - 5c + c \\
 & = -4ab - 4c
 \end{aligned}$$

add the opposite

$$\begin{aligned}
 \text{(c)} \quad & -(3ab - 5c) + 6(ab - c) \\
 & = +(-3ab + 5c) + 6ab - 6c \\
 & = -3ab + 5c + 6ab - 6c \\
 & = -3ab + 6ab + 5c - 6c \\
 & = 3ab - c
 \end{aligned}$$

$$\begin{aligned}
 \text{(d)} \quad & -(3ab - 5c) - 6(ab - c) \\
 & = +(-3ab + 5c) - 6ab + 6c \\
 & = -3ab + 5c - 6ab + 6c \\
 & = -3ab - 6ab + 5c + 6c \\
 & = -9ab + 11c
 \end{aligned}$$