Alg 1   1.2

$$15 - 3 + 4 = 15 - 7 = 8$$
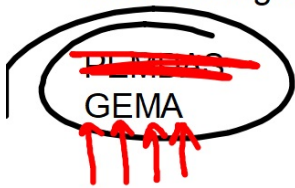
Evaluate numerical expressions using the order of operations.
Evaluate algebraic expressions using order of operations

~~PEMDAS~~

GEMA
↑↑↑↑

$$\overset{10 \quad +3}{5 \cdot 2 + 3} = 13 \qquad 15 \div 3 + 4 = 16$$

$$\cancel{5 \cdot 2 + 3 = 25}$$

Key Concept   Order of Operations

Step 1	Evaluate expressions inside grouping symbols.	
Step 2	Evaluate all powers.	
Step 3	Do all multiplications ~~and/or divisions~~ from left to right.	x recip
Step 4	Do all additions ~~and/or subtractions~~ from left to right.	s mato

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Example **1** *Evaluate Expressions*

Evaluate each expression.

a. $3 + (2 \cdot 3) + 5$ $= 20 \frac{1}{2}$

$3 + 6 + 5 = 14$

b. $15 \div 3 \cdot 5 - 4^2$

$15 \cdot \frac{1}{3} \cdot 5 + {}^-16$

$25 + {}^-16 = 9$

Example **2** *Grouping Symbols*

Evaluate each expression.

a. $2(5) + 3(4 + 3)$

$2(5) + 3(7)$

$10 + 21 = 31$

b. $2[5 + (30 \div 6)^2]$

$2[5 + (5)^2]$

$2[5 + 25]$

$2 \cdot 30$

$= 60$

$2(5)$

$(2)(5)$

$(2)5$

Example 3 Fraction Bar

Evaluate $\dfrac{6 + 4^2}{3^2 \cdot 4}$.

$$\frac{(6+4^2)}{(3^2 \cdot 4)} = \frac{22 \div 2}{36 \div 2} = \frac{11}{18}$$

Example 4 Evaluate an Algebraic Expression

Evaluate $a^2 - (b^3 - 4c)$ if $a = 7$, $b = 3$, and $c = 5$.

$$7^2 - (3^3 - 4 \cdot 5)$$
$$7^2 - (27 + {}^-20)$$
$$7^2 - 7 \qquad = 49 - 7 = 42$$

Evaluate each expression.

4. $(4 + 6)7 = 70$
$=$

5. $50 + (12 + 9) = 26$
$=$

6. $29 - 3(9 \cdot 5 \cdot 4)$

7. $[14) - 4] + [9 + 32)]$

$10 + 41$

51

8. $\dfrac{(4 \cdot 3)^2 \cdot 5}{9 + 3}$

$\dfrac{144 \cdot 5}{12}$ $\dfrac{720}{12}$

$= 60$

9. $\dfrac{\left(3 + 8\right)}{\left(5^2(4)\right)}$ $\dfrac{11}{100}$

Evaluate each expression if $g = 4$, $h = 6$, $j = 8$, and $k = 12$.

10. $hk - gj$

11. $2k + gh^2 - j$

12. $\dfrac{2g(h - g)}{gh - j}$

$6 \cdot 12 - 4 \cdot 8$

$72 - 32$

40

WB 1.2 skills

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