1.7 SUBSTITUTION

Symbols or letters are sometimes used as replacements for numbers in an expression. To calculate the value of the expression we substitute numbers for the symbols or letters and solve each by using the rules for order of operations **(BEDMAS)** as shown in the examples below.

EXAMPLE #1

Evaluate the expression below if:
$\square = 5$ and $\diamond = 2$

$3 \times \square - 4 \times \diamond$
$3 \times 5 - 4 \times 2$
$15 - 8 = 7$

EXAMPLE #2

Evaluate the expression below if:
$a = 3$ and $b = 2$

$5ab + 4a - 10$
$5 \cdot 3 \cdot 2 + 4 \cdot 3 - 10$
$30 + 12 - 10 = 32$

A. Evaluate each of the following by substitution.

1. $\square - \diamond$, if $\square = 8$ and $\diamond = 3$ — 5
2. $\square \times \diamond$, if $\square = 9$ and $\diamond = 13$ — 117
3. $\diamond + \square - 6$, if $\square = 5$ and $\diamond = 14$ — 13
4. $(2 \times \diamond) - (3 \times \square)$, if $\square = 7$ and $\diamond = 23$ — 25
5. $2 \times \square + 2 \times \diamond$, if $\square = 13$ and $\diamond = 9$ — 44
6. $(\square \div 4) \times (9 - \diamond)$, if $\square = 28$ and $\diamond = 5$ — 28
7. $\square \times \diamond - 16$, if $\square = 3$ and $\diamond = 7$ — 5
8. $\square \times (\diamond - 2)$, if $\square = 5$ and $\diamond = 8$ — 30
9. $\square \times (\diamond - 5)$, if $\square = 7$ and $\diamond = 12$ — 49
10. $48 \div (2 \times \square) + \diamond$, if $\square = 8$ and $\diamond = 15$ — 18
11. $(5 + \diamond) \times \square$, if $\square = 7$ and $\diamond = 6$ — 77
12. $2 + \square + 9 - \diamond$, if $\diamond = 8$ and $\square = 3$ — 6
13. $\frac{\diamond + \diamond}{3 + \diamond}$, if $\square = 9$ and $\diamond = 3$ — 1
14. $\frac{2 \times \square - 3 \times \diamond}{\square - (\diamond + 2)}$, if $\square = 8$ and $\diamond = 5$ — 1
15. $\frac{\square + \diamond}{\square - \diamond}$, if $\square = 16$ and $\diamond = 8$ — 3
16. $\frac{12 \times (\square - \diamond)}{\diamond + 9}$, if $\square = 11$ and $\diamond = 7$ — 3
17. $\frac{\square + 3 \times \diamond}{\diamond}$, if $\square = 4$ and $\diamond = 4$ — 4
18. $\frac{5 \times \square - 3 \times \diamond}{4 \times (\square - 1)}$, if $\square = 5$ and $\diamond = 3$ — 1
19. $\frac{\square + \diamond + 2}{\diamond}$, if $\square = 4$ and $\diamond = 2$ — 4
20. $\frac{\square \times \diamond}{\diamond \times \square}$, if $\square = 8$ and $\diamond = 22$ — 1
21. $\frac{3 \times \square + 2 \times \diamond}{\diamond}$, if $\square = 7$ and $\diamond = 3$ — 9
22. $\frac{\diamond + \diamond + \diamond - \diamond}{\square}$, if $\diamond = 4$ and $\square = 2$ — 4