

Multiplying a Polynomial by a Monomial The Distributive Law

Introduction:

Evaluate: $3(2 + 2)$ using BEDMAS

$$= 3(4)$$

$$= 12$$

Is there another method that would yield the same answer?

$$3(2+2)$$

$$= 6+6 = 12$$

Which method above would be the preferred method?

Bedmas

method 2

Now, if the question was simplify $3(2x + 2)$, which of the above methods cannot be used? Why?

unlike terms

Therefore, $3(2x + 2)$ This is called the Distributive Law.
 $= 6x + 6$

More Examples:

1. Expand (simplify):

(a) $2(3a - 2b)$
 $= 6a - 4b$

(b) $-4(m^2 - 3m + 2)$
 $= -4m^2 + 12m - 8$

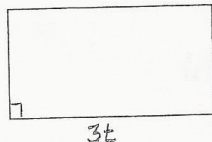
(c) $2a^3(3a^2 - 7a)$
 $= 6a^5 - 14a^4$

(d) $(5y - 2x + 1)(2x^2)$
 $= 10x^2y - 4x^3 + 2x^2$

2. Find expressions for the perimeter, P, and the area, A, for each of the following figures.

(a)

$2t + 1$



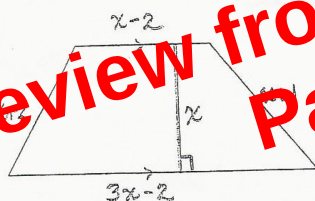
$3t$

$P = 2(l + w)$ or $P = 2l + 2w$

$A = lw$

$P = 2(3t + 2t + 1)$ or $P = 2(3t) + 2(2t + 1)$
 $= 2(5t + 1)$ or $= 6t + 4t + 2$
 $= 10t + 2$ or $= 10t + 2$

(b)



$P = s_1 + s_2 + s_3 + s_4$

$A = \frac{h(a+b)}{2}$

$P = (x+2) + (x+1) + (x-2) + (3x-2)$
 $= x+2 + x+1 + x-2 + 3x-2$
 $= 6x - 1$

$A = \frac{x(x-2+3x-2)}{2}$
 $= \frac{x(4x-4)}{2}$

$= \frac{4x^2 - 4x}{2}$
 $= \frac{4x^2}{2} - \frac{4x}{2}$
 $= 2x^2 - 2x$

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