Topic: Distributive property and binomial multiplication

Question: Use the distributive property to expand the expression.

$$3(x+2)(x+6)$$

Answer choices:

A $x^2 + 12x + 12$

B $3x^2 + 8x + 36$

C $3x^2 + 24x + 36$

D $x^2 + 8x + 4$

Solution: C

The distributive property tells us to multiply the value outside the parentheses by each of the terms inside the parentheses. We'll start by distributing the 3 across the $x + 2$.

$$3(x + 2)(x + 6)$$

$$\big[3(x) + 3(2)\big](x + 6)$$

$$(3x + 6)(x + 6)$$

Now we'll distribute both of the terms in the brackets across both of the terms in the parentheses.

$$3x(x + 6) + 6(x + 6)$$

$$3x(x) + 3x(6) + 6(x) + 6(6)$$

$$3x^2 + 18x + 6x + 36$$

$$3x^2 + 24x + 36$$

Topic: Distributive property and binomial multiplication

Question: Expand the expression.

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

Answer choices:

A $2x^4+16x^3-30x^2-12x$

B $2x^4-8x^3-30x^2-12x$

C $2x^4+16x^3-30x^2+36x$

D $2x^4-8x^3-30x^2+36x$

Solution: D

The distributive property tells us to multiply the value outside the parentheses by each of the terms inside the parentheses. We'll start by distributing the $2x$ across the $x - 1$.

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

$$\left(2x^2-2x\right)(x+3)(x-6)$$

Now we'll distribute the $2x^2 - 2x$ across the $x + 3$.

$$\left(2x^3+6x^2-2x^2-6x\right)(x-6)$$

$$\left(2x^3+4x^2-6x\right)(x-6)$$

Then we'll distribute the trinomial across the $x - 6$.

$$2x^4-12x^3+4x^3-24x^2-6x^2+36x$$

$$2x^4-8x^3-30x^2+36x$$

Topic: Distributive property and binomial multiplication

Question: Use the FOIL method to expand this expression. Collect like terms in descending order.

$$(3x - 4)(5x + 2)$$

Answer choices:

A $15x^2 + 26x - 2$

B $15x^2 - 26x + 8$

C $15x^2 + 14x - 2$

D $15x^2 - 14x - 8$

Solution: D

To expand

$$(3x-4)(5x+2)$$

you multiply pairs of terms.

First pair	$3x \cdot 5x = 15x^2$
Outside pair	$3x \cdot 2 = 6x$
Inside pair	$-4 \cdot 5x = -20x$
Last pair	$-4 \cdot 2 = -8$

The sum of all these terms is

$$15x^2 - 14x - 8$$