

Multiplying Binomials Part 2

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Mathematics 9
Polynomials
Multiplying Binomials Part 2

A. Definitions

1. **binomial:** the expression that contains two terms.

$$x - 5 \quad , \quad a^2 b + 3c$$

B. Examples

1. Multiply the following binomials.

a) $(m+5)(m+4)$

$$\begin{array}{r} m^2 + 4m + 5m + 20 \\ \boxed{m^2 + 9m + 20} \end{array}$$

b) $(n-3)(n+3)$

$$\begin{array}{r} n^2 + 3n - 3n - 9 \\ \boxed{n^2 - 9} \end{array}$$

c) $(x-6)(x-2)$

$$\begin{array}{r} x^2 - 2x - 6x + 12 \\ \boxed{x^2 - 8x + 12} \end{array}$$

d) $(2m-3)(3m-2)$

$$\begin{array}{r} 6m^2 - 4m - 9m + 6 \\ \boxed{6m^2 - 13m + 6} \end{array}$$

e) $(4x+1)(4x-1)$

$$\begin{array}{r} 16x^2 - 4x + 4x - 1 \\ \boxed{16x^2 - 1} \end{array}$$

f) $(3y+2)(2y+5)$

$$\begin{array}{r} 6y^2 + 15y + 4y + 10 \\ \boxed{6y^2 + 19y + 10} \end{array}$$

g) $(4n - 3)(2n - 7)$

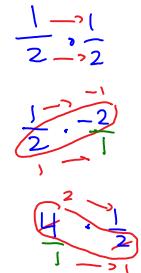
$$8n^2 \cancel{-28n} \cancel{-6n} + 21$$

$$\boxed{8n^2 - 34n + 21}$$

h) $\left(\frac{1}{2}y + 4\right)\left(\frac{1}{2}y - 2\right)$

$$\frac{1}{4}y^2 \cancel{-y} \cancel{+2y} - 8$$

$$\boxed{\frac{1}{4}y^2 + y - 8}$$



i) $(x^2 - 5)(x^2 + 2)$

$$x^4 \cancel{+2x^2} \cancel{-5x^2} - 10$$

$$\boxed{x^4 - 3x^2 - 10}$$

j) $(5x + 3y)(2x - y)$

$$10x^2 \cancel{-5xy} \cancel{+6xy} - 3y^2$$

$$\boxed{10x^2 + xy - 3y^2}$$

k) $(4m - 7n)(4m + 7n)$

$$16m^2 \cancel{+28mn} \cancel{-28mn} - 49n^2$$

$$\boxed{16m^2 - 49n^2}$$

l) $(3a^2 + 2b)(2a^2 - 3b)$

$$6a^4 \cancel{-9a^2b} \cancel{+4a^2b} - 6b^2$$

$$\boxed{6a^4 - 5a^2b - 6b^2}$$

Assignment:

Multiplying Binomial 2 Part Assignment #2 – 5

Name: _____

Multiplying Binomials Part 2 Assignment

Solve the following on a separate piece of paper.

2. Find each product.

- | | | |
|----------------------|---|---|
| a) $(x + 3)(x + 4)$ | b) $(n + 2)(n + 6)$ | c) $(a - 5)(a - 3)$ |
| d) $(t - 1)(t - 4)$ | e) $(x - 2)(x + 5)$ | f) $(n + 3)(n - 4)$ |
| g) $(a + 6)(a - 8)$ | h) $(x + 9)(x - 7)$ | i) $(x + 12)(x - 5)$ |
| j) $(s - 11)(s - 3)$ | k) $\left(n + \frac{1}{2}\right)\left(n + \frac{1}{2}\right)$ | l) $\left(a - \frac{2}{3}\right)\left(a + \frac{1}{2}\right)$ |

3. Find each product.

- | | | |
|---------------------|----------------------|-----------------------|
| a) $(a + 1)(a - 2)$ | b) $(n - 3)(n - 2)$ | c) $(y - 4)(y + 5)$ |
| d) $(b - 6)(b + 3)$ | e) $(a - 10)(a - 6)$ | f) $(n + 10)(n + 12)$ |
| g) $(x - 1)(x + 5)$ | h) $(y - 8)(y + 11)$ | i) $(z - 5)(z + 6)$ |
| j) $(a + 2)(a - 3)$ | k) $(b + 10)(b + 4)$ | l) $(x - 9)(x - 1)$ |

(B)

4. Find each product.

- | | | |
|-----------------------|------------------------|-----------------------|
| a) $(3x + 2)(x - 1)$ | b) $(2a - 5)(a - 3)$ | c) $(4n - 7)(n + 5)$ |
| d) $(x + 3)(6x - 5)$ | e) $(12x + 1)(3x - 1)$ | f) $(5n - 1)(2n - 2)$ |
| g) $(7c - 5)(2c + 1)$ | h) $(6x - 2)(3x + 1)$ | i) $(3x - 1)(x + 2)$ |
| j) $(3a + 1)(2a - 5)$ | k) $(8y - 3)(5y - 1)$ | l) $(2x - 3)(4x + 7)$ |

5. a) $(x - 3)(5x + 2)$

b) $(2a + 1)(2a + 3)$

c) $(8n - 3)(2n - 1)$

d) $(4a + 3)(4a + 3)$

e) $(3x - 2)(4x - 3)$

f) $(5x + 1)(6x - 4)$

g) $(6x - 3)(2x - 5)$

h) $(3b + 2)(3b - 2)$

i) $(5a + 1)(4a - 7)$

j) $(a + 8)(8a + 1)$

6. Find each product.

- | | | |
|----------------------|---|-----------------------|
| a) $(a - 3)(1 - a)$ | b) $(x - 1)(1 - x)$ | c) $(2y - 1)(5 + y)$ |
| d) $(2z - 4)(1 + z)$ | e) $\left(\frac{1}{2}x + 3\right)\left(3 - \frac{1}{4}x\right)$ | f) $(3x - 2)(2 + 5x)$ |

Answers

1. a) $x^2 + 8x + 15$ b) $a^2 + 6a + 8$
c) $n^2 + 8n + 7$
2. a) $x^2 + 7x + 12$ b) $n^2 + 8n + 12$
c) $a^2 - 8a + 15$ d) $t^2 - 5t + 14$
e) $x^2 + 3x - 10$ f) $n^2 - n - 12$
g) $a^2 - 2a - 48$ h) $x^2 + 2x - 63$
i) $x^2 + 7x - 60$ j) $s^2 - 14s + 33$
k) $n^2 + n + \frac{1}{4}$ l) $a^2 - \frac{1}{6}a - \frac{1}{3}$
3. a) $a^2 - a - 2$ b) $n^2 - 5n + 6$
c) $y^2 + y - 20$ d) $b^2 - 3b - 18$
e) $a^2 - 16a + 60$ f) $n^2 + 22n + 120$
g) $x^2 + 4x - 5$ h) $y^2 + 3y - 88$
i) $z^2 - 11z + 30$ j) $a^2 - a - 6$
k) $b^2 + 14b + 40$ l) $x^2 - 10x + 9$
4. a) $3x^2 - x - 2$ b) $2a^2 - 11a + 15$
c) $4n^2 + 13n - 35$ d) $6x^2 + 13x - 15$
e) $36x^2 - 9x - 1$ f) $10n^2 - 12n + 2$
g) $14c^2 - 3c - 5$ h) $18x^2 - 2$
i) $3x^2 + 5x - 2$ j) $6a^2 - 13a - 5$
k) $40y^2 - 23y + 3$ l) $8x^2 + 2x - 21$
5. a) $5x^2 - 13x - 6$ b) $4a^2 + 8a + 3$
c) $16n^2 - 14n + 3$ d) $16a^2 + 24a + 9$
e) $12x^2 - 17x + 6$ f) $30x^2 - 14x - 4$
g) $12x^2 - 36x + 15$ h) $9b^2 - 4$
i) $20a^2 - 31a - 7$ j) $8a^2 + 65a + 8$
6. a) $-a^2 + 4a - 3$ b) $-x^2 + 2x - 1$
c) $2y^2 + 9y - 5$ d) $2z^2 - 2z - 4$
e) $-\frac{1}{8}x^2 + \frac{3}{4}x + 9$ f) $15x^2 - 4x - 4$