Multiplying Three Mon/Polynomials (A)

Simplify each expression.

1. $(3p^2 - 6p - 8)(-4p^5 + 4p^4 + 3p^3)(8p^2 - 6p + 1)$

2. $(7t^2 + 3t)(9t^2 + 5t)(2t^2 - 7t)$

3. $(-9z^4 - 2z^3 - 3z^2)(-5z^5 - z^4 - 7z^3)(-5z + 9)$

4. $7w^4(-9w^2 - 8w)(w - 2)$

5. $(-9s + 1)(-6s^5 + 8s^4)(7s^4 - 8s^3)$

Multiplying Three Mon/Polynomials (A) Answers

Simplify each expression.

1. $(3p^2 - 6p - 8)(-4p^5 + 4p^4 + 3p^3)(8p^2 - 6p + 1)$
$= -96p^9 + 360p^8 - 92p^7 - 466p^6 + 125p^5 + 94p^4 - 24p^3$

2. $(7t^2 + 3t)(9t^2 + 5t)(2t^2 - 7t)$
$= 126t^6 - 317t^5 - 404t^4 - 105t^3$

3. $(-9z^4 - 2z^3 - 3z^2)(-5z^5 - z^4 - 7z^3)(-5z + 9)$
$= -225z^{10} + 310z^9 - 229z^8 + 635z^7 + 48z^6 + 189z^5$

4. $7w^4(-9w^2 - 8w)(w - 2)$
$= -63w^7 + 70w^6 + 112w^5$

5. $(-9s + 1)(-6s^5 + 8s^4)(7s^4 - 8s^3)$
$= 378s^{10} - 978s^9 + 680s^8 - 64s^7$

Multiplying Three Mon/Polynomials (B)

Simplify each expression.

1. $-3x^4(x^2 - 9x - 9)(-7x^2 + 5x)$

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

3. $-8t^4(-6t^2 - t + 2)(4t^2 + 6t)$

4. $7x^4(-x^4 - 9x^3)(8x^5 + 3x^4 - 8x^3)$

5. $-4m^4(9m + 2)(5m^5 - 7m^4)$

Multiplying Three Mon/Polynomials (B) Answers

Simplify each expression.

1. $-3x^4(x^2 - 9x - 9)(-7x^2 + 5x)$
$= 21x^8 - 204x^7 - 54x^6 + 135x^5$

2. $3a^4(-2a^5 - a^4 - 4a^3)(-2a^2 + 4a + 2)$
$= 12a^{11} - 18a^{10} - 54a^8 - 24a^7$

3. $-8t^4(-6t^2 - t + 2)(4t^2 + 6t)$
$= 192t^8 + 320t^7 - 16t^6 - 96t^5$

4. $7x^4(-x^4 - 9x^3)(8x^5 + 3x^4 - 8x^3)$
$= -56x^{13} - 525x^{12} - 133x^{11} + 504x^{10}$

5. $-4m^4(9m + 2)(5m^5 - 7m^4)$
$= -180m^{10} + 212m^9 + 56m^8$

Multiplying Three Mon/Polynomials (C)

Simplify each expression.

1. $(-7d^3 + 5d^2 - 7d)(-9d^4 + 8d^3)(8d^2 - 9d)$

2. $(5p^5 - 4p^4 + 5p^3)(7p^5 - 4p^4 + 3p^3)(-p^3 + 8p^2 + 7p)$

3. $(2m^4 + m^3 + m^2)(7m^2 + 2m - 3)(-5m + 2)$

4. $(-7c - 9)(-6c^3 + 3c^2 - c)(-9c - 9)$

5. $(-6v^5 - 2v^4 + 3v^3)(-5v^5 - 7v^4 - 8v^3)(5v^3 + 9v^2 - 5v)$

Multiplying Three Mon/Polynomials (C) Answers

Simplify each expression.

1. $(-7d^3 + 5d^2 - 7d)(-9d^4 + 8d^3)(8d^2 - 9d)$
$= 504d^9 - 1375d^8 + 1733d^7 - 1375d^6 + 504d^5$

2. $(5p^5 - 4p^4 + 5p^3)(7p^5 - 4p^4 + 3p^3)(-p^3 + 8p^2 + 7p)$
$= -35p^{13} + 328p^{12} - 205p^{11} + 224p^{10} + 191p^9 - 104p^8 + 105p^7$

3. $(2m^4 + m^3 + m^2)(7m^2 + 2m - 3)(-5m + 2)$
$= -70m^7 - 27m^6 + 7m^5 + 11m^4 + 13m^3 - 6m^2$

4. $(-7c - 9)(-6c^3 + 3c^2 - c)(-9c - 9)$
$= -378c^5 - 675c^4 - 117c^3 + 99c^2 - 81c$

5. $(-6v^5 - 2v^4 + 3v^3)(-5v^5 - 7v^4 - 8v^3)(5v^3 + 9v^2 - 5v)$
$= 150v^{13} + 530v^{12} + 553v^{11} + 138v^{10} - 400v^9 - 191v^8 + 120v^7$

Multiplying Three Mon/Polynomials (D)

Simplify each expression.

1. $(-6p^3 + 9p^2 + 4p)(6p^4 - 3p^3)(9p^3 - 8p^2 - 8p)$

2. $-9y(-2y^3 - 9y^2 - 2y)(6y^4 - 5y^3)$

3. $k^3(8k^5 - 5k^4)(9k^3 + 6k^2 - 6k)$

4. $-2d^2(-9d^4 - 6d^3)(4d^2 + d + 4)$

5. $-s^2(s^4 + 9s^3 - 4s^2)(s^2 + 4s + 2)$

Multiplying Three Mon/Polynomials (D) Answers

Simplify each expression.

1. $(-6p^3 + 9p^2 + 4p)(6p^4 - 3p^3)(9p^3 - 8p^2 - 8p)$
$= -324p^{10} + 936p^9 - 315p^8 - 660p^7 + 120p^6 + 96p^5$

2. $-9y(-2y^3 - 9y^2 - 2y)(6y^4 - 5y^3)$
$= 108y^8 + 396y^7 - 297y^6 - 90y^5$

3. $k^3(8k^5 - 5k^4)(9k^3 + 6k^2 - 6k)$
$= 72k^{11} + 3k^{10} - 78k^9 + 30k^8$

4. $-2d^2(-9d^4 - 6d^3)(4d^2 + d + 4)$
$= 72d^8 + 66d^7 + 84d^6 + 48d^5$

5. $-s^2(s^4 + 9s^3 - 4s^2)(s^2 + 4s + 2)$
$= -1s^8 - 13s^7 - 34s^6 - 2s^5 + 8s^4$

Multiplying Three Mon/Polynomials (E)

Simplify each expression.

1. $(-3p^5 + 6p^4 + p^3)(-9p^3 + 5p^2 - p)(4p^3 + 5p^2)$

2. $(-8p^4 - 2p^3 - 3p^2)(5p^3 + 7p^2 + 6p)(-2p^2 - 4p)$

3. $(9h + 8)(9h^2 - h - 8)(-6h^4 + 4h^3)$

4. $(2h^2 + 4h)(-5h^2 + 6h - 1)(2h^5 + 5h^4 - 7h^3)$

5. $2v^2(-6v^2 - 3v)(-5v^2 + 6v + 7)$

Multiplying Three Mon/Polynomials (E) Answers

Simplify each expression.

1. $(-3p^5 + 6p^4 + p^3)(-9p^3 + 5p^2 - p)(4p^3 + 5p^2)$
$= 108p^{11} - 141p^{10} - 249p^9 + 116p^8 - 9p^7 - 5p^6$

2. $(-8p^4 - 2p^3 - 3p^2)(5p^3 + 7p^2 + 6p)(-2p^2 - 4p)$
$= 80p^9 + 292p^8 + 418p^7 + 374p^6 + 168p^5 + 72p^4$

3. $(9h + 8)(9h^2 - h - 8)(-6h^4 + 4h^3)$
$= -486h^7 - 54h^6 + 732h^5 + 64h^4 - 256h^3$

4. $(2h^2 + 4h)(-5h^2 + 6h - 1)(2h^5 + 5h^4 - 7h^3)$
$= -20h^9 - 66h^8 + 74h^7 + 158h^6 - 174h^5 + 28h^4$

5. $2v^2(-6v^2 - 3v)(-5v^2 + 6v + 7)$
$= 60v^6 - 42v^5 - 120v^4 - 42v^3$

Multiplying Three Mon/Polynomials (F)

Simplify each expression.

1. $(-s^3 - 8s^2 + 3s)(9s^4 + s^3 - 3s^2)(-9s + 8)$

2. $(5t^3 - 7t^2 + 3t)(-t^3 - 3t^2)(3t^4 - 6t^3)$

3. $(-9n^5 + 3n^4)(7n^3 + n^2)(-3n^5 - n^4)$

4. $(7w - 7)(4w^4 + 6w^3 - 7w^2)(8w^4 - 5w^3)$

5. $(3s^2 - 2s)(5s^5 - 7s^4 + 7s^3)(8s^3 + 7s^2)$

Multiplying Three Mon/Polynomials (F) Answers

Simplify each expression.

1. $(-s^3 - 8s^2 + 3s)(9s^4 + s^3 - 3s^2)(-9s + 8)$
$= 81s^8 + 585s^7 - 782s^6 - 67s^5 + 297s^4 - 72s^3$

2. $(5t^3 - 7t^2 + 3t)(-t^3 - 3t^2)(3t^4 - 6t^3)$
$= -15t^{10} + 6t^9 + 102t^8 - 135t^7 + 54t^6$

3. $(-9n^5 + 3n^4)(7n^3 + n^2)(-3n^5 - n^4)$
$= 189n^{13} + 27n^{12} - 21n^{11} - 3n^{10}$

4. $(7w - 7)(4w^4 + 6w^3 - 7w^2)(8w^4 - 5w^3)$
$= 224w^9 - 28w^8 - 798w^7 + 847w^6 - 245w^5$

5. $(3s^2 - 2s)(5s^5 - 7s^4 + 7s^3)(8s^3 + 7s^2)$
$= 120s^{10} - 143s^9 + 63s^8 + 133s^7 - 98s^6$

Multiplying Three Mon/Polynomials (G)

Simplify each expression.

1. $6p^2(-2p^3 + 5p^2)(8p^5 + 4p^4 + 3p^3)$

2. $-4r^4(-4r^5 - 5r^4)(-r^4 - 8r^3 + 3r^2)$

3. $(-8s^5 + 9s^4)(5s^4 + 4s^3 - 2s^2)(-3s - 5)$

4. $(-2c^3 + c^2 + 8c)(8c^2 - 8c + 1)(-2c^4 - 3c^3)$

5. $(6w^4 - 8w^3)(-4w^4 + 3w^3 - w^2)(-4w^5 - w^4)$

Multiplying Three Mon/Polynomials (G) Answers

Simplify each expression.

1. $6p^2(-2p^3 + 5p^2)(8p^5 + 4p^4 + 3p^3)$
$= -96p^{10} + 192p^9 + 84p^8 + 90p^7$

2. $-4r^4(-4r^5 - 5r^4)(-r^4 - 8r^3 + 3r^2)$
$= -16r^{13} - 148r^{12} - 112r^{11} + 60r^{10}$

3. $(-8s^5 + 9s^4)(5s^4 + 4s^3 - 2s^2)(-3s - 5)$
$= 120s^{10} + 161s^9 - 221s^8 - 206s^7 + 90s^6$

4. $(-2c^3 + c^2 + 8c)(8c^2 - 8c + 1)(-2c^4 - 3c^3)$
$= 32c^9 - 180c^7 - 36c^6 + 173c^5 - 24c^4$

5. $(6w^4 - 8w^3)(-4w^4 + 3w^3 - w^2)(-4w^5 - w^4)$
$= 96w^{13} - 176w^{12} + 70w^{11} - 2w^{10} - 8w^9$

Multiplying Three Mon/Polynomials (H)

Simplify each expression.

1. $(3f^5 - 5f^4)(-9f^2 + 8f - 1)(-3f^2 + 4f + 5)$

2. $(-3r^4 + 3r^3 - 7r^2)(7r^4 - 4r^3 - 7r^2)(-4r^2 - 6r + 4)$

3. $-7x^2(8x^2 + 8x + 9)(-9x^3 - 3x^2 - 2x)$

4. $(3b^2 + 8b)(2b^4 + b^3)(-b^4 - 7b^3 + 4b^2)$

5. $-7s^5(-2s^5 - 3s^4 + 5s^3)(-4s^5 - 9s^4 - 8s^3)$

Multiplying Three Mon/Polynomials (H) Answers

Simplify each expression.

1. $(3f^5 - 5f^4)(-9f^2 + 8f - 1)(-3f^2 + 4f + 5)$
$= 81f^9 - 315f^8 + 270f^7 + 158f^6 - 195f^5 + 25f^4$

2. $(-3r^4 + 3r^3 - 7r^2)(7r^4 - 4r^3 - 7r^2)(-4r^2 - 6r + 4)$
$= 84r^{10} - 6r^9 - 122r^8 + 344r^7 - 398r^6 - 266r^5 + 196r^4$

3. $-7x^2(8x^2 + 8x + 9)(-9x^3 - 3x^2 - 2x)$
$= 504x^7 + 672x^6 + 847x^5 + 301x^4 + 126x^3$

4. $(3b^2 + 8b)(2b^4 + b^3)(-b^4 - 7b^3 + 4b^2)$
$= -6b^{10} - 61b^9 - 117b^8 + 20b^7 + 32b^6$

5. $-7s^5(-2s^5 - 3s^4 + 5s^3)(-4s^5 - 9s^4 - 8s^3)$
$= -56s^{15} - 210s^{14} - 161s^{13} + 147s^{12} + 280s^{11}$

Multiplying Three Mon/Polynomials (I)

Simplify each expression.

1. $(-5c^2 - c - 9)(-7c^2 - 3c - 5)(-3c^3 - 2c^2 + 9c)$

2. $(5p^5 + 8p^4 + 7p^3)(-7p^4 - 4p^3 + 5p^2)(8p^2 + 4p)$

3. $-9p^3(9p^4 - 3p^3 - 6p^2)(-p^5 - 4p^4)$

4. $9b^4(-2b + 7)(-5b^4 + 8b^3)$

5. $(-4h^2 - 9h)(-9h^5 + 5h^4 - 6h^3)(8h^4 + 3h^3 - 2h^2)$

Multiplying Three Mon/Polynomials (I) Answers

Simplify each expression.

1. $(-5c^2 - c - 9)(-7c^2 - 3c - 5)(-3c^3 - 2c^2 + 9c)$
$= -105c^7 - 136c^6 - 2c^5 - 80c^4 + 620c^3 + 198c^2 + 405c$

2. $(5p^5 + 8p^4 + 7p^3)(-7p^4 - 4p^3 + 5p^2)(8p^2 + 4p)$
$= -280p^{11} - 748p^{10} - 752p^9 - 128p^8 + 328p^7 + 140p^6$

3. $-9p^3(9p^4 - 3p^3 - 6p^2)(-p^5 - 4p^4)$
$= 81p^{12} + 297p^{11} - 162p^{10} - 216p^9$

4. $9b^4(-2b + 7)(-5b^4 + 8b^3)$
$= 90b^9 - 459b^8 + 504b^7$

5. $(-4h^2 - 9h)(-9h^5 + 5h^4 - 6h^3)(8h^4 + 3h^3 - 2h^2)$
$= 288h^{11} + 596h^{10} - 57h^9 + 247h^8 + 204h^7 - 108h^6$

Multiplying Three Mon/Polynomials (J)

Simplify each expression.

1. $(-x^2 - 6x)(-2x^5 - 2x^4 - 2x^3)(5x^5 - 7x^4 + 4x^3)$

2. $(5g^3 + 2g^2 - g)(4g^4 - g^3)(-9g^3 - 5g^2)$

3. $(-9h^4 - 4h^3 + 8h^2)(-5h^5 + 3h^4 + 2h^3)(-3h^4 + 2h^3 - h^2)$

4. $(-7x^3 + 2x^2 + 5x)(9x^5 - 9x^4 + 8x^3)(5x^2 - 4x - 3)$

5. $(2a^4 + 9a^3 - 7a^2)(8a^3 + 6a^2)(-9a^5 + 3a^4)$

Multiplying Three Mon/Polynomials (J) Answers

Simplify each expression.

1. $(-x^2 - 6x)(-2x^5 - 2x^4 - 2x^3)(5x^5 - 7x^4 + 4x^3)$
$= 10x^{12} + 56x^{11} - 20x^{10} + 18x^9 - 28x^8 + 48x^7$

2. $(5g^3 + 2g^2 - g)(4g^4 - g^3)(-9g^3 - 5g^2)$
$= -180g^{10} - 127g^9 + 39g^8 + 21g^7 - 5g^6$

3. $(-9h^4 - 4h^3 + 8h^2)(-5h^5 + 3h^4 + 2h^3)(-3h^4 + 2h^3 - h^2)$
$= -135h^{13} + 111h^{12} + 151h^{11} - 181h^{10} + 54h^9 + 16h^8 - 16h^7$

4. $(-7x^3 + 2x^2 + 5x)(9x^5 - 9x^4 + 8x^3)(5x^2 - 4x - 3)$
$= -315x^{10} + 657x^9 - 280x^8 - 272x^7 + 403x^6 - 73x^5 - 120x^4$

5. $(2a^4 + 9a^3 - 7a^2)(8a^3 + 6a^2)(-9a^5 + 3a^4)$
$= -144a^{12} - 708a^{11} + 270a^{10} + 372a^9 - 126a^8$