

Multiplying Three Binomials (A)

Simplify each expression.

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

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

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

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

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

Multiplying Three Binomials (A) Answers

Simplify each expression.

$$\begin{aligned} 1. & (-2t^4 + 8t^3)(-6t^2 + 9t)(-9t^4 - 8t^3) \\ & = -108t^{10} + 498t^9 - 120t^8 - 576t^7 \end{aligned}$$

$$\begin{aligned} 2. & (-3z^3 - 9z^2)(5z^5 - 8z^4)(-9z^5 + 4z^4) \\ & = 135z^{13} + 129z^{12} - 732z^{11} + 288z^{10} \end{aligned}$$

$$\begin{aligned} 3. & (8d^3 - 9d^2)(-d^2 + 2d)(-4d - 7) \\ & = 32d^6 - 44d^5 - 103d^4 + 126d^3 \end{aligned}$$

$$\begin{aligned} 4. & (4y^4 - 6y^3)(y^2 - 4y)(2y + 7) \\ & = 8y^7 - 16y^6 - 106y^5 + 168y^4 \end{aligned}$$

$$\begin{aligned} 5. & (7c^2 + 6c)(6c^5 + 4c^4)(7c^3 + 2c^2) \\ & = 294c^{10} + 532c^9 + 296c^8 + 48c^7 \end{aligned}$$

Multiplying Three Binomials (B)

Simplify each expression.

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

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

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

4. $(-3n^4 + n^3)(-4n^5 - 4n^4)(n^4 + 3n^3)$

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

Multiplying Three Binomials (B) Answers

Simplify each expression.

$$\begin{aligned} 1. & (-8t^3 + 5t^2)(2t^5 + 4t^4)(5t^4 + 5t^3) \\ & = -80t^{12} - 190t^{11} - 10t^{10} + 100t^9 \end{aligned}$$

$$\begin{aligned} 2. & (-4r^2 - 6r)(-6r^4 + 2r^3)(4r^4 + 6r^3) \\ & = 96r^{10} + 256r^9 + 120r^8 - 72r^7 \end{aligned}$$

$$\begin{aligned} 3. & (d^5 + 4d^4)(-5d^5 + 2d^4)(2d^2 + 8d) \\ & = -10d^{12} - 76d^{11} - 128d^{10} + 64d^9 \end{aligned}$$

$$\begin{aligned} 4. & (-3n^4 + n^3)(-4n^5 - 4n^4)(n^4 + 3n^3) \\ & = 12n^{13} + 44n^{12} + 20n^{11} - 12n^{10} \end{aligned}$$

$$\begin{aligned} 5. & (-5d^5 + 9d^4)(-9d^3 - d^2)(-6d^2 - 9d) \\ & = -270d^{10} + 51d^9 + 738d^8 + 81d^7 \end{aligned}$$

Multiplying Three Binomials (C)

Simplify each expression.

1. $(7g^4 + 3g^3)(5g^2 + 8g)(6g - 3)$

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

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

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

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

Multiplying Three Binomials (C) Answers

Simplify each expression.

$$\begin{aligned} 1. & (7g^4 + 3g^3)(5g^2 + 8g)(6g - 3) \\ & = 210g^7 + 321g^6 - 69g^5 - 72g^4 \end{aligned}$$

$$\begin{aligned} 2. & (5t - 4)(9t^2 + 9t)(4t^4 + 7t^3) \\ & = 180t^7 + 351t^6 - 81t^5 - 252t^4 \end{aligned}$$

$$\begin{aligned} 3. & (5d^2 - d)(9d^3 + 3d^2)(-8d - 5) \\ & = -360d^6 - 273d^5 - 6d^4 + 15d^3 \end{aligned}$$

$$\begin{aligned} 4. & (-6d^5 + 4d^4)(-6d^5 + 2d^4)(-7d^5 + 4d^4) \\ & = -252d^{15} + 396d^{14} - 200d^{13} + 32d^{12} \end{aligned}$$

$$\begin{aligned} 5. & (-h^3 + 6h^2)(9h^4 - 6h^3)(h^3 - 2h^2) \\ & = -9h^{10} + 78h^9 - 156h^8 + 72h^7 \end{aligned}$$

Multiplying Three Binomials (D)

Simplify each expression.

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

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

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

4. $(-4w^2 + 9w)(7w + 8)(6w^2 - 6w)$

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

Multiplying Three Binomials (D) Answers

Simplify each expression.

$$\begin{aligned} 1. & (7t^5 + 4t^4)(-7t + 9)(8t^3 - t^2) \\ & = -392t^9 + 329t^8 + 253t^7 - 36t^6 \end{aligned}$$

$$\begin{aligned} 2. & (8z + 6)(3z^5 + 6z^4)(2z^5 - 2z^4) \\ & = 48z^{11} + 84z^{10} - 60z^9 - 72z^8 \end{aligned}$$

$$\begin{aligned} 3. & (5r + 3)(7r^5 - r^4)(8r^2 + 5r) \\ & = 280r^8 + 303r^7 + 56r^6 - 15r^5 \end{aligned}$$

$$\begin{aligned} 4. & (-4w^2 + 9w)(7w + 8)(6w^2 - 6w) \\ & = -168w^5 + 354w^4 + 246w^3 - 432w^2 \end{aligned}$$

$$\begin{aligned} 5. & (7q^2 - 2q)(-7q^3 + 2q^2)(-q^3 - 8q^2) \\ & = 49q^8 + 364q^7 - 220q^6 + 32q^5 \end{aligned}$$

Multiplying Three Binomials (E)

Simplify each expression.

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

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

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

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

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

Multiplying Three Binomials (E) Answers

Simplify each expression.

$$\begin{aligned} 1. & (4q - 1)(3q^5 + 8q^4)(2q - 2) \\ & = 24q^7 + 34q^6 - 74q^5 + 16q^4 \end{aligned}$$

$$\begin{aligned} 2. & (3n^2 - 8n)(5n^2 - 9n)(2n^4 - 6n^3) \\ & = 30n^8 - 224n^7 + 546n^6 - 432n^5 \end{aligned}$$

$$\begin{aligned} 3. & (-6n^3 + 8n^2)(-9n^2 - 8n)(-8n^5 + 3n^4) \\ & = -432n^{10} + 354n^9 + 440n^8 - 192n^7 \end{aligned}$$

$$\begin{aligned} 4. & (r^3 + 3r^2)(-2r^3 + 8r^2)(8r^5 - 4r^4) \\ & = -16r^{11} + 24r^{10} + 184r^9 - 96r^8 \end{aligned}$$

$$\begin{aligned} 5. & (-8k^3 + 7k^2)(-3k^3 + 5k^2)(-6k^2 + 4k) \\ & = -144k^8 + 462k^7 - 454k^6 + 140k^5 \end{aligned}$$

Multiplying Three Binomials (F)

Simplify each expression.

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

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

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

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

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

Multiplying Three Binomials (F) Answers

Simplify each expression.

$$\begin{aligned} 1. & (4v - 2)(4v^3 + 2v^2)(-5v^5 + 7v^4) \\ & = -80v^9 + 112v^8 + 20v^7 - 28v^6 \end{aligned}$$

$$\begin{aligned} 2. & (-6n^3 - 6n^2)(4n + 2)(8n + 8) \\ & = -192n^5 - 480n^4 - 384n^3 - 96n^2 \end{aligned}$$

$$\begin{aligned} 3. & (8k^2 + 3k)(-k^2 - 9k)(7k^2 - 2k) \\ & = -56k^6 - 509k^5 - 39k^4 + 54k^3 \end{aligned}$$

$$\begin{aligned} 4. & (9t^5 + 4t^4)(-2t^5 - 3t^4)(3t^3 + 3t^2) \\ & = -54t^{13} - 159t^{12} - 141t^{11} - 36t^{10} \end{aligned}$$

$$\begin{aligned} 5. & (-6g - 8)(-5g + 8)(9g^3 + 2g^2) \\ & = 270g^5 - 12g^4 - 592g^3 - 128g^2 \end{aligned}$$

Multiplying Three Binomials (G)

Simplify each expression.

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

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

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

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

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

Multiplying Three Binomials (G) Answers

Simplify each expression.

$$\begin{aligned} 1. & (-7y^3 + y^2)(-5y^3 + 7y^2)(-6y^4 - 3y^3) \\ & = -210y^{10} + 219y^9 + 120y^8 - 21y^7 \end{aligned}$$

$$\begin{aligned} 2. & (9w^3 + 6w^2)(-5w^3 - 8w^2)(-7w - 2) \\ & = 315w^7 + 804w^6 + 540w^5 + 96w^4 \end{aligned}$$

$$\begin{aligned} 3. & (-8n^4 + 2n^3)(-5n^5 + 8n^4)(-9n^5 - 8n^4) \\ & = -360n^{14} + 346n^{13} + 448n^{12} - 128n^{11} \end{aligned}$$

$$\begin{aligned} 4. & (7g^3 + 6g^2)(-3g^5 + 3g^4)(-4g^5 + 4g^4) \\ & = 84g^{13} - 96g^{12} - 60g^{11} + 72g^{10} \end{aligned}$$

$$\begin{aligned} 5. & (-8m^2 + 2m)(-9m^2 - 3m)(-5m^2 - 2m) \\ & = -360m^6 - 174m^5 + 18m^4 + 12m^3 \end{aligned}$$

Multiplying Three Binomials (H)

Simplify each expression.

1. $(7g^5 - 8g^4)(7g^5 - 8g^4)(-6g^4 - 5g^3)$

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

3. $(-9q^4 - q^3)(-6q^2 + 7q)(-5q - 1)$

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

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

Multiplying Three Binomials (H) Answers

Simplify each expression.

$$\begin{aligned} 1. & (7g^5 - 8g^4)(7g^5 - 8g^4)(-6g^4 - 5g^3) \\ & = -294g^{14} + 427g^{13} + 176g^{12} - 320g^{11} \end{aligned}$$

$$\begin{aligned} 2. & (-9g^3 + 3g^2)(-g - 6)(-g - 8) \\ & = -9g^5 - 123g^4 - 390g^3 + 144g^2 \end{aligned}$$

$$\begin{aligned} 3. & (-9q^4 - q^3)(-6q^2 + 7q)(-5q - 1) \\ & = -270q^7 + 231q^6 + 92q^5 + 7q^4 \end{aligned}$$

$$\begin{aligned} 4. & (-8r^3 - r^2)(4r^2 - r)(8r^5 - 6r^4) \\ & = -256r^{10} + 224r^9 - 16r^8 - 6r^7 \end{aligned}$$

$$\begin{aligned} 5. & (-m^4 - 4m^3)(-6m - 7)(3m^2 + 6m) \\ & = 18m^7 + 129m^6 + 270m^5 + 168m^4 \end{aligned}$$

Multiplying Three Binomials (I)

Simplify each expression.

1. $(6p^2 + 2p)(-9p^4 - 9p^3)(8p^4 + 5p^3)$

2. $(7h^3 - 9h^2)(9h^2 - 4h)(-9h^2 - h)$

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

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

5. $(-7p + 6)(6p^3 + p^2)(9p^2 - 7p)$

Multiplying Three Binomials (I) Answers

Simplify each expression.

$$\begin{aligned} 1. & (6p^2 + 2p)(-9p^4 - 9p^3)(8p^4 + 5p^3) \\ & = -432p^{10} - 846p^9 - 504p^8 - 90p^7 \end{aligned}$$

$$\begin{aligned} 2. & (7h^3 - 9h^2)(9h^2 - 4h)(-9h^2 - h) \\ & = -567h^7 + 918h^6 - 215h^5 - 36h^4 \end{aligned}$$

$$\begin{aligned} 3. & (-3v^2 + 8v)(7v + 2)(7v^3 + 9v^2) \\ & = -147v^6 + 161v^5 + 562v^4 + 144v^3 \end{aligned}$$

$$\begin{aligned} 4. & (-6t^5 - 4t^4)(-9t - 3)(2t^2 + 9t) \\ & = 108t^8 + 594t^7 + 510t^6 + 108t^5 \end{aligned}$$

$$\begin{aligned} 5. & (-7p + 6)(6p^3 + p^2)(9p^2 - 7p) \\ & = -378p^6 + 555p^5 - 149p^4 - 42p^3 \end{aligned}$$

Multiplying Three Binomials (J)

Simplify each expression.

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

2. $(2z^3 - 9z^2)(2z + 1)(2z - 3)$

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

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

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

Multiplying Three Binomials (J) Answers

Simplify each expression.

$$\begin{aligned} 1. & (-2z^5 + z^4)(-8z^5 + 5z^4)(-5z^5 + 3z^4) \\ & = -80z^{15} + 138z^{14} - 79z^{13} + 15z^{12} \end{aligned}$$

$$\begin{aligned} 2. & (2z^3 - 9z^2)(2z + 1)(2z - 3) \\ & = 8z^5 - 44z^4 + 30z^3 + 27z^2 \end{aligned}$$

$$\begin{aligned} 3. & (-b + 8)(-5b^2 + 7b)(9b^2 - 7b) \\ & = 45b^5 - 458b^4 + 833b^3 - 392b^2 \end{aligned}$$

$$\begin{aligned} 4. & (-4t^4 + 6t^3)(t^3 - 8t^2)(-7t^2 - 3t) \\ & = 28t^9 - 254t^8 + 222t^7 + 144t^6 \end{aligned}$$

$$\begin{aligned} 5. & (-9w^3 - 9w^2)(w^5 - 8w^4)(-w^5 + 6w^4) \\ & = 9w^{13} - 117w^{12} + 306w^{11} + 432w^{10} \end{aligned}$$