Activity 1.2.4: Factoring the Sum and Difference of Two Cubes

Total points = 34

Answers

1. $27x^3 - 64y^3z^6$ ✓
   $= (3x)^3 - (4yz^2)^3$ ✓
   $= (3x - 4yz^2)\,(9x^2 + 12xyz^2 + 16y^2z^4)$ ✓
2. $8x^3 + 125$ ✓
   $= (2x)^3 + (5)^3$ ✓
   $= (2x+5)\,(4x^2 - 10x + 25)$ ✓
3. $64a^3 - 8b^9c^3$ ✓
   $= 8(8a^3 - b^9c^3)$ ✓
   $= 8[(2a)^3 - (b^3c)^3]$ ✓
   $= 8\,(2a - b^3c)\,(4a^2 + 2ab^3c + b^6c^2)$ ✓
4. $27m^3 + 125n^3$ ✓
   $= (3m)^3 + (5n)^3$ ✓
   $= (3m+5n)\,(9m^2 - 15mn + 25n^2)$ ✓
5. $64a^3 + 27$ ✓
   $= (4a)^3 + (3)^3$ ✓
   $= (4a+3)\,(16a^2 - 12a + 9)$ ✓
6. $8x^9y^3 - 64z^6$ ✓
   $= 8(x^9y^3 - 8z^6)$ ✓
   $= 8[(x^3y)^3 - (2z^2)^3]$ ✓
   $= 8\,(x^3y - 2z^2)\,(x^6y^2 + 2x^3yz^2 + 4z^4)$ ✓
7. $216x^3 + 8y^9$ ✓
   $= 8(27x^3 + y^9)$ ✓
   $= 8[(3x)^3 + (y^3)^3]$ ✓
   $= 8\,(3x + y^3)\,(9x^2 - 3xy^3 + y^6)$ ✓
8. $a^3b^6 - 64c^9d^3$ ✓
   $= (ab^2)^3 - (4c^3d)^3$ ✓
   $= (ab^2 - 4c^3d)\,(a^2b^4 + 4ab^2c^3d + 16c^6d^2)$ ✓
9. $125m^3 - 27n^6$ ✓
   $= (5m)^3 - (3n^2)^3$ ✓
   $= (5m - 3n^2)\,(25m^2 + 15mn^2 + 9n^4)$ ✓
10. $216a^6 + 64b^9$ ✓
    $= 8(27a^6 + 8b^9)$ ✓
    $= 8[(3a^2)^3 + (2b^3)^3]$ ✓
    $= 8\,(3a^2 + 2b^3)\,(9a^4 - 6a^2b^3 + 4b^6)$ ✓

Typeset by Jonathan Rufo Bacolod using LaTeX

Activity 1.2.4: Factoring the Sum and Difference of Two Cubes

Total points = 34

Answers

1. $27x^3 - 64y^3z^6$ ✓ $= (3x)^3 - (4yz^2)^3$ ✓ $= (3x - 4yz^2)\,(9x^2 + 12xyz^2 + 16y^2z^4)$ ✓
2. $8x^3 + 125$ ✓ $= (2x)^3 + (5)^3$ ✓ $= (2x+5)\,(4x^2 - 10x + 25)$ ✓
3. $64a^3 - 8b^9c^3$ ✓ $= 8(8a^3 - b^9c^3)$ ✓ $= 8[(2a)^3 - (b^3c)^3]$ ✓ $= 8\,(2a - b^3c)\,(4a^2 + 2ab^3c + b^6c^2)$ ✓
4. $27m^3 + 125n^3$ ✓ $= (3m)^3 + (5n)^3$ ✓ $= (3m+5n)\,(9m^2 - 15mn + 25n^2)$ ✓
5. $64a^3 + 27$ ✓ $= (4a)^3 + (3)^3$ ✓ $= (4a+3)\,(16a^2 - 12a + 9)$ ✓
6. $8x^9y^3 - 64z^6$ ✓ $= 8(x^9y^3 - 8z^6)$ ✓ $= 8[(x^3y)^3 - (2z^2)^3]$ ✓ $= 8\,(x^3y - 2z^2)\,(x^6y^2 + 2x^3yz^2 + 4z^4)$ ✓
7. $216x^3 + 8y^9$ ✓ $= 8(27x^3 + y^9)$ ✓ $= 8[(3x)^3 + (y^3)^3]$ ✓ $= 8\,(3x + y^3)\,(9x^2 - 3xy^3 + y^6)$ ✓
8. $a^3b^6 - 64c^9d^3$ ✓ $= (ab^2)^3 - (4c^3d)^3$ ✓ $= (ab^2 - 4c^3d)\,(a^2b^4 + 4ab^2c^3d + 16c^6d^2)$ ✓
9. $125m^3 - 27n^6$ ✓ $= (5m)^3 - (3n^2)^3$ ✓ $= (5m - 3n^2)\,(25m^2 + 15mn^2 + 9n^4)$ ✓
10. $216a^6 + 64b^9$ ✓ $= 8(27a^6 + 8b^9)$ ✓ $= 8[(3a^2)^3 + (2b^3)^3]$ ✓ $= 8\,(3a^2 + 2b^3)\,(9a^4 - 6a^2b^3 + 4b^6)$ ✓

Typeset by Jonathan Rufo Bacolod using LaTeX

Activity 1.2.4: Factoring the Sum and Difference of Two Cubes

Total points = 34

Answers

1. $27x^3 - 64y^3z^6$ ✓ $= (3x)^3 - (4yz^2)^3$ ✓ $= (3x - 4yz^2)\,(9x^2 + 12xyz^2 + 16y^2z^4)$ ✓
2. $8x^3 + 125$ ✓ $= (2x)^3 + (5)^3$ ✓ $= (2x+5)\,(4x^2 - 10x + 25)$ ✓
3. $64a^3 - 8b^9c^3$ ✓ $= 8(8a^3 - b^9c^3)$ ✓ $= 8[(2a)^3 - (b^3c)^3]$ ✓ $= 8\,(2a - b^3c)\,(4a^2 + 2ab^3c + b^6c^2)$ ✓
4. $27m^3 + 125n^3$ ✓ $= (3m)^3 + (5n)^3$ ✓ $= (3m+5n)\,(9m^2 - 15mn + 25n^2)$ ✓
5. $64a^3 + 27$ ✓ $= (4a)^3 + (3)^3$ ✓ $= (4a+3)\,(16a^2 - 12a + 9)$ ✓
6. $8x^9y^3 - 64z^6$ ✓ $= 8(x^9y^3 - 8z^6)$ ✓ $= 8[(x^3y)^3 - (2z^2)^3]$ ✓ $= 8\,(x^3y - 2z^2)\,(x^6y^2 + 2x^3yz^2 + 4z^4)$ ✓
7. $216x^3 + 8y^9$ ✓ $= 8(27x^3 + y^9)$ ✓ $= 8[(3x)^3 + (y^3)^3]$ ✓ $= 8\,(3x + y^3)\,(9x^2 - 3xy^3 + y^6)$ ✓
8. $a^3b^6 - 64c^9d^3$ ✓ $= (ab^2)^3 - (4c^3d)^3$ ✓ $= (ab^2 - 4c^3d)\,(a^2b^4 + 4ab^2c^3d + 16c^6d^2)$ ✓
9. $125m^3 - 27n^6$ ✓ $= (5m)^3 - (3n^2)^3$ ✓ $= (5m - 3n^2)\,(25m^2 + 15mn^2 + 9n^4)$ ✓
10. $216a^6 + 64b^9$ ✓ $= 8(27a^6 + 8b^9)$ ✓ $= 8[(3a^2)^3 + (2b^3)^3]$ ✓ $= 8\,(3a^2 + 2b^3)\,(9a^4 - 6a^2b^3 + 4b^6)$ ✓

Typeset by Jonathan Rufo Bacolod using LaTeX

Activity 1.2.4: Factoring the Sum and Difference of Two Cubes

Total points = 34

Answers

1. $27x^3 - 64y^3z^6$ ✓ $= (3x)^3 - (4yz^2)^3$ ✓ $= (3x - 4yz^2)\,(9x^2 + 12xyz^2 + 16y^2z^4)$ ✓
2. $8x^3 + 125$ ✓ $= (2x)^3 + (5)^3$ ✓ $= (2x+5)\,(4x^2 - 10x + 25)$ ✓
3. $64a^3 - 8b^9c^3$ ✓ $= 8(8a^3 - b^9c^3)$ ✓ $= 8[(2a)^3 - (b^3c)^3]$ ✓ $= 8\,(2a - b^3c)\,(4a^2 + 2ab^3c + b^6c^2)$ ✓
4. $27m^3 + 125n^3$ ✓ $= (3m)^3 + (5n)^3$ ✓ $= (3m+5n)\,(9m^2 - 15mn + 25n^2)$ ✓
5. $64a^3 + 27$ ✓ $= (4a)^3 + (3)^3$ ✓ $= (4a+3)\,(16a^2 - 12a + 9)$ ✓
6. $8x^9y^3 - 64z^6$ ✓ $= 8(x^9y^3 - 8z^6)$ ✓ $= 8[(x^3y)^3 - (2z^2)^3]$ ✓ $= 8\,(x^3y - 2z^2)\,(x^6y^2 + 2x^3yz^2 + 4z^4)$ ✓
7. $216x^3 + 8y^9$ ✓ $= 8(27x^3 + y^9)$ ✓ $= 8[(3x)^3 + (y^3)^3]$ ✓ $= 8\,(3x + y^3)\,(9x^2 - 3xy^3 + y^6)$ ✓
8. $a^3b^6 - 64c^9d^3$ ✓ $= (ab^2)^3 - (4c^3d)^3$ ✓ $= (ab^2 - 4c^3d)\,(a^2b^4 + 4ab^2c^3d + 16c^6d^2)$ ✓
9. $125m^3 - 27n^6$ ✓ $= (5m)^3 - (3n^2)^3$ ✓ $= (5m - 3n^2)\,(25m^2 + 15mn^2 + 9n^4)$ ✓
10. $216a^6 + 64b^9$ ✓ $= 8(27a^6 + 8b^9)$ ✓ $= 8[(3a^2)^3 + (2b^3)^3]$ ✓ $= 8\,(3a^2 + 2b^3)\,(9a^4 - 6a^2b^3 + 4b^6)$ ✓