

Math Sheet

Name _____ Score _____ / 10 Teacher _____ Date _____

Factoring by Grouping

Factor each cubic completely over the integers by grouping the first two and last two terms. Write Prime over the integers when appropriate.

1. $z^3 - 4z^2 + z - 4$

2. $m^3 + 3m^2 - 6m - 18$

3. $y^3 - 4y^2 + 3y - 12$

4. $x^3 + x^2 - x - 1$

5. $m^3 + m^2 - 5m - 5$

6. $x^3 + 6x^2 - 8x - 48$

7. $p^3 + 7p^2 - 9p - 63$

8. $n^3 - 7n^2 - 9n + 63$

9. $y^3 - 6y^2 + 8y - 48$

10. $z^3 + 6z^2 + 4z + 24$

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Factoring by Grouping

Answer key

Factor each cubic completely over the integers by grouping the first two and last two terms. Write Prime over the integers when appropriate.

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

2. $m^3 + 3m^2 - 6m - 18$
 $= (m^2(m + 3) - 6(m + 3))$
 $= (m + 3)(m^2 - 6)$

3. $y^3 - 4y^2 + 3y - 12$
 $= (y^2(y - 4) + 3(y - 4))$
 $= (y - 4)(y^2 + 3)$

4. $x^3 + x^2 - x - 1$
 $= (x^2(x + 1) - 1(x + 1))$
 $= (x - 1)(x + 1)(x + 1)$

5. $m^3 + m^2 - 5m - 5$
 $= (m^2(m + 1) - 5(m + 1))$
 $= (m + 1)(m^2 - 5)$

6. $x^3 + 6x^2 - 8x - 48$
 $= (x^2(x + 6) - 8(x + 6))$
 $= (x + 6)(x^2 - 8)$

7. $p^3 + 7p^2 - 9p - 63$
 $= (p^2(p + 7) - 9(p + 7))$
 $= (p - 3)(p + 3)(p + 7)$

8. $n^3 - 7n^2 - 9n + 63$
 $= (n^2(n - 7) - 9(n - 7))$
 $= (n - 3)(n - 7)(n + 3)$

9. $y^3 - 6y^2 + 8y - 48$
 $= (y^2(y - 6) + 8(y - 6))$
 $= (y - 6)(y^2 + 8)$

10. $z^3 + 6z^2 + 4z + 24$
 $= (z^2(z + 6) + 4(z + 6))$
 $= (z + 6)(z^2 + 4)$