Unit V – Second Degree Relations and Higher - Polynomials
Part C – Solving Equations and Inequalities by Factoring
Lesson 9 – Synthetic Division

Use synthetic division in each of the following to show whether the binomial is a factor of the other polynomial. Be sure to allow for all degrees of the variable.

1. $(2x^3 - 15x + 15) \div (x + 3)$

2. $(2y^4 + 2y + 15 - 19y^2) \div (y + 3)$

3. $(15c^3 - 28c^2 + 15c - 8) \div (c - 2)$

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

5. $(8x^2 - 6x - 20) \div (x - 2)$

6. $(4y^3 + 9y^2 + y + 36) \div (y + 3)$

7. $(3x^3 - 10x^2 + 14x - 7) \div (x - 2)$

8. $(2x^4 + 11x^3 - 27x - 10) \div (x + 5)$

9. $(3x^4 + 3x^3 - 20x^2 - 2x + 12) \div (x + 3)$

10. $(9x^6 + 3x^5 + x^2 - 4) \div (x + 3)$

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1. ⁻3 | 2   0   ⁻15   15
            ⁻6   18   ⁻9
         2   ⁻6   3   6

Division is not even. $(x+3)$ is not a factor.

2. ⁻3 | 2   0   ⁻19   2   15
            ⁻6   18   3   ⁻15
         2   ⁻6   ⁻1   5   0

Division is even. $(y+3)$ is a factor.

3. 2 | 15   ⁻28   15   ⁻8
          30   4   38
       15   2   19   30

Division is not even. $(c-2)$ is not a factor.

4. ⁻1 | 3   1   ⁻3
            ⁻3   2
         3   ⁻2   ⁻1

Division is not even. $(c+1)$ is not a factor.

5. 2 | 8   ⁻6   ⁻20
          16   20
       8   10   0

Division is even. $(c-2)$ is a factor.

6. ⁻3 | 4   9   1   36
            ⁻12   9   ⁻30
         4   ⁻3   10   6

Division is not even. $(y+3)$ is not a factor.

7. 2 | 3   ⁻10   14   ⁻7
          6   ⁻8   12
       3   ⁻4   6   5

Division is not even. $(x-2)$ is not a factor.

8. ⁻5 | 2   11   0   ⁻27   ⁻10
            ⁻10   ⁻5   25   10
         2   1   ⁻5   ⁻2   0

Division is even. $(x+5)$ is a factor.

9. ⁻3 | 3   3   ⁻20   ⁻2   12
            ⁻9   18   6   ⁻12
         3   ⁻6   ⁻2   4   0

Division is even. $(x+3)$ is a factor.

10. ⁻3 | 9   3   0   0   1   0   ⁻4
             ⁻27   72   ⁻216   648   ⁻1947   ⁻5841
          9   ⁻24   72   ⁻216   649   ⁻1947   ⁻5845

Division is even. $(x+3)$ is a factor.