

Name _____

Use the table of values and the location principle to find what two consecutive x -integers a real root must fall between

1)

x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$	11	2	-1	-8	-17	-2	1	7	-2

x -integers (values): _____

Determine which method is appropriate to use to solve the following equations. **DO NOT** actually **SOLVE** them! Fill in the blank with “**G**” for grouping, “**C**” for GCF, “**P**” for perfect cube factoring (little parenthesis/big parenthesis), “**Q**” for quadratic substitution or “**R**” for the rational root theorem (p’s & q’s).

2) _____ $x^6 + 9x^3 + 20 = 0$

3) _____ $3x^3 - 12x^2 - 15x = 0$

4) _____ $2x^3 - 8x^2 + 5x - 20 = 0$

4) _____ $x^5 + x^4 - 7x^2 + 4x = 10$

5) _____ $x^5 - 9x^3 = 0$

6) _____ $x^4 + 8x^3 + 8 + x = 0$

7) _____ $x^3 = 27$

8) _____ $2x^4 - 9x^2 - 5 = 0$

Solve the following equations by grouping.

9) $3x^3 + 2x^2 - 27x - 18 = 0$

10) $4x^3 + x - 32x^2 = 8$

Change each equation into a quadratic (*quadratic substitution*), then solve. Be sure to find *all* the roots. Round to nearest tenths if necessary.

11) $x^4 - 12x^2 + 20 = 0$

12) $3x^4 + x^2 - 8 = 0$

For the following polynomial functions, list all their possible rational roots. **DO NOT SOLVE**, just list!

13) $f(x) = x^6 - 5x^3 + 2x^2 + 24$

p: _____

q: _____

p/q: _____

14) $g(x) = 3x^3 + x - 8$

p: _____

q: _____

p/q: _____

15) $y = 14x^4 + 13x^3 + 12x^2 + 1$

p: _____

q: _____

p/q: _____

16) $h(x) = 4x^5 - 10x^4 - 9x^3 + 2x^2 + x - 4$

p: _____

q: _____

p/q: _____

Solve each equation using the rational root theorem (p's & q's).

17) $x^4 + 6x^3 + 10x^2 + 6x + 9 = 0$

18) $8x^4 + 2x^3 - 35x^2 - 8x + 12 = 0$