Name _____ Class _____ Date _____

5-5 Practice

Form G

Use the Rational Root Theorem to list all possible rational roots for each equation. Then find any actual rational roots. Use your graphing calculator to choose which of the possible roots to try.

1. $x^3 + 5x^2 - 2x - 15 = 0$

2. $36x^3 + 144x^2 - x - 4 = 0$

3. $2x^3 + 5x^2 + 4x + 1 = 0$

4. $12x^4 + 14x^3 - 5x^2 - 14x - 4 = 0$

5. $5x^3 - 11x^2 + 7x - 1 = 0$

6. $x^3 + 81x^2 - 49x - 49 = 0$

A polynomial function $P(x)$ with rational coefficients has the given roots. Find two additional roots of $P(x) = 0$. Recall that irrational and complex roots must have a conjugate pair.

7. $2 + 3i$ and $\sqrt{7}$

8. $3 - \sqrt{2}$ and $1 + \sqrt{3}$

9. $-4i$ and $6 - i$

10. $5 - \sqrt{6}$ and $-2 + \sqrt{10}$

11. $\sqrt{5}$ and $-\sqrt{13}$

12. $1 - \sqrt{10}$ and $2 + \sqrt{2}$

Write a polynomial function with rational coefficients so that $P(x) = 0$ has the given roots.

13. 4 and 6

14. -5 and -1

15. $3i$ and $\sqrt{6}$

16. $2 + i$ and $1 - \sqrt{5}$

17. -5 and $3i$

18. i and $5i$

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5-5 Practice (continued) *Form G*

Find all rational roots for $P(x) = 0$. Show work on separate paper.

23. $P(x) = x^3 - 5x^2 + 2x + 8$

24. $P(x) = x^3 + x^2 - 17x + 15$

25. $P(x) = 2x^3 + 13x^2 + 17x - 12$

26. $P(x) = x^3 - x^2 - 34x - 56$

27. $P(x) = x^3 - 18x + 27$

28. $P(x) = x^4 - 5x^2 + 4$

29. $P(x) = x^3 - 6x^2 + 13x - 10$

30. $P(x) = x^3 - 5x^2 + 4x + 10$

31. $P(x) = x^3 - 5x^2 + 17x - 13$

32. $P(x) = x^3 + x + 10$

33. $P(x) = x^3 - 5x^2 - x + 5$

34. $P(x) = x^3 - 12x + 16$

35. $P(x) = x^3 - 2x^2 - 5x + 6$

36. $P(x) = x^3 - 8x^2 - 200$

37. $P(x) = x^3 + x^2 - 5x + 3$

38. $P(x) = 4x^3 - 12x^2 - x + 3$

39. $P(x) = x^3 + x^2 - 7x + 2$

40. $P(x) = 12x^3 + 31x^2 - 17x - 6$

Write a polynomial function $P(x)$ with rational coefficients so that $P(x) = 0$ has the given roots.

41. $\sqrt{3}, 2, -i$

42. $5, 2i$

43. $-1, 3 + I$

44. $-\sqrt{7}, i$

45. $-4, 4i$

46. $6, 3 - 2i$