Name: _____ **Period:** _____

5.5 – 5.7 Quiz Review

5.5

Factor each expression completely

1. $x^6 - 10x^5 + 25x^4$

2. $2x^3 - 3x^2 - 20x$

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

4. $x^4 - 5x^2 + 4$

5. $x^3 + 27$

6. $2t^4 - 16t$

Factor & solve each equation.

7. $x^4 + 24x^2 = 25$

8. $3x^4 + 13x^3 = -4x^2$

9. $x^4 + 7x^2 - 18 = 0$

10. $12x^3 + 8x^2 - 3x - 2 = 0$

11. $8x^3 + 27 = 0$

12. $2x^3 = 16$

5.6

Use the remainder theorem to determine whether the given binomial is a factor of P(x). If yes, find the remaining factors and write P(x) in its fully factored form.

13. $(x-3); P(x) = x^3 - x^2 - 14x + 24$

14. $(x+3); P(x) = x^3 + 5x^2 - 29x - 105$

Use the remainder theorem to determine whether the given binomial is a factor of P(x). If yes, find the remaining factors and write P(x) in its fully factored form.

15. $(x+2); P(x) = 3x^3 + 11x^2 + 2x + 16$

Use synthetic substitution to evaluate each function.

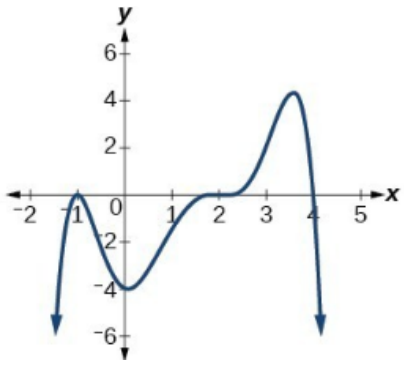
16. $P\left(-\frac{1}{2}\right); P(x) = 4x^4 - 8x^3 - 3x^2 + 7x + 12$

17. $P(-2); P(x) = x^4 + 3x^2 - 6x + 1$

Writing higher degree polynomials from graphs using multiplicities.

Write the equation for each graph in factored form using multiplicities.

18.

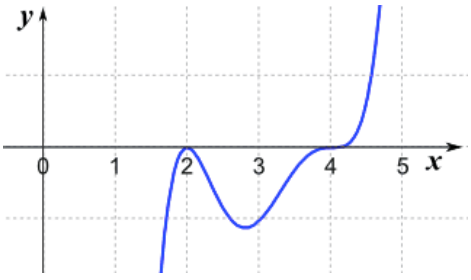


Degree: _____

Factored Form:

_____

19.



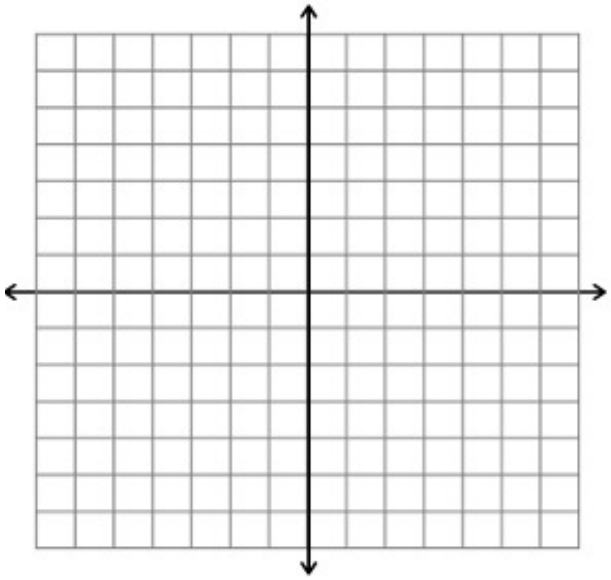
Degree: _____

Factored Form:

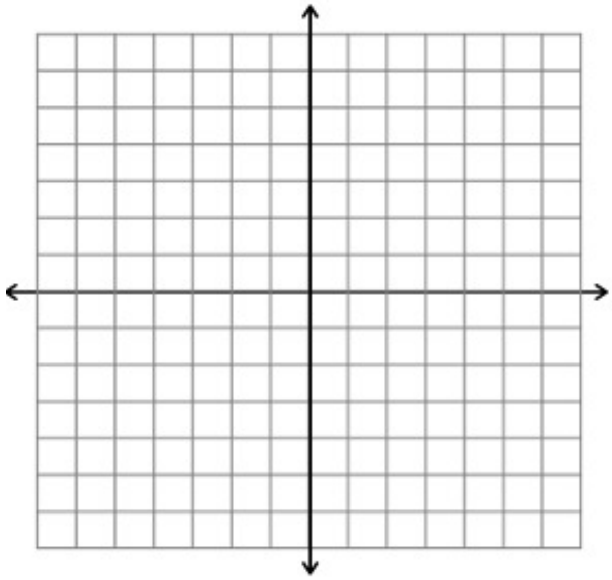
_____

Sketch the graph of the given polynomials using multiplicities.

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



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



5.7

State the number of roots, based on the degree of the equation. Identify any real roots using a calculator and use synthetic division to reduce the polynomial to a quadratic. Factor & solve for the remaining roots. State the multiplicity of each root.

22. $x^4 - 6x^2 + 8x - 3 = 0$

23. $2x^5 + 12x^4 + 16x^3 - 12x^2 - 18x = 0$

24. $x^4 + x^3 - x^2 + 5x - 30 = 0$

State the degree, then write the *simplest* polynomial function with the given zeros.

25. $-2; 2; 3$

26. $\sqrt{2}; -1$

27. $2i; -3$

28. $1-i; 2$

29. If $(1-\sqrt{5})$ is a root of a polynomial with integer coefficients, which of the following must be another root?

A) $-\sqrt{5}$

B) $\sqrt{5}-1$

C) -4

D) $1+\sqrt{5}$

30. If 5 and $(7+i\sqrt{2})$ are roots of a polynomial with integer coefficients, what must be another root?

31. What is the degree of the simplest polynomial containing the roots, *2i* & $\sqrt{5}$?