Name: _____ Period: _____

5.5 – 5.7 TEST Review

Factor completely. Write in complete factored form

1. $5x^4 + 40x$

2. $3x^2 + 13x - 10$

3. $2x^3 - 12x^2 - 32x + 192$

4. $x^4 - 29x^2 + 100$

Factor & solve each equation.

5. $6x^5 + 48x^2 = 0$

6. $8t^3 = 27$

7. $x^4 + 4x^2 = 32$

8. $4x^5 - 8x^3 + 4x = 0$

9. $15x^2 - 17x + 4 = 0$

10. $2x^3 - 5x^2 - 4x + 10 = 0$

II. Remainder and Factor Theorem

Use synthetic substitution to evaluate each function.

11. $P\left(-\frac{1}{3}\right); P(x) = 3x^3 - 5x^2 + 4x + 2$

12. $F\left(\frac{4}{5}\right); F(x) = 25x^2 + 16$

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.

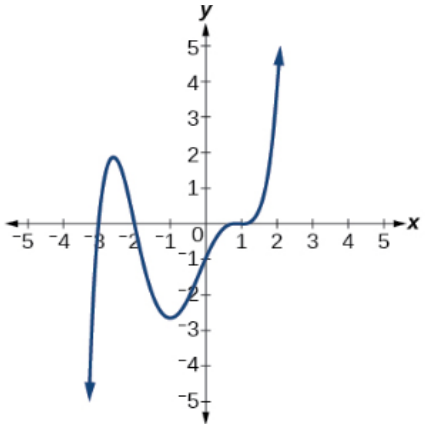
13. $(x - 2); P(x) = x^3 + 5x^2 - 4x + 20$

14. $(x - 4); P(x) = x^3 - 10x^2 + 32x - 32$

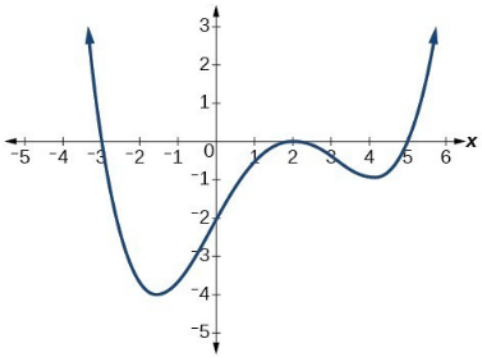
15. $(x + 6); P(x) = x^3 - 27x + 54$

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

16.

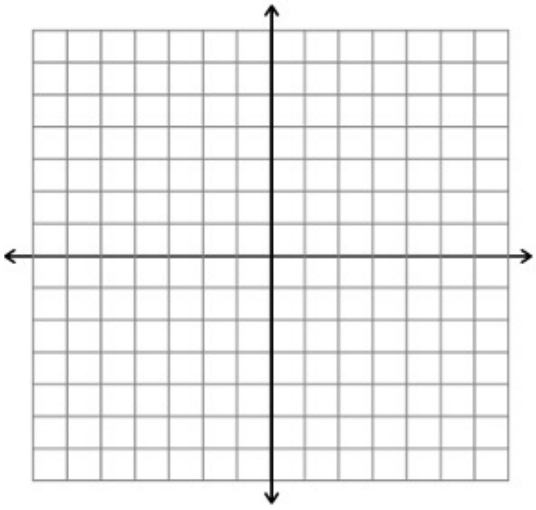


17.

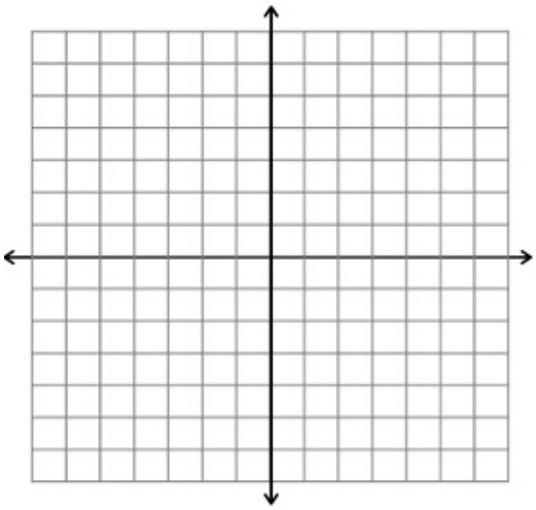


Sketch the graph of the given polynomials using multiplicities.

18. $f(x) = (x-5)^3(x-1)(x+4)^2$



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



III. Fundamental Theorem of Algebra

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

20. $x^4 - 4x^3 + 29x^2 - 100x + 100 = 0$

21. $x^5 - 3x^4 + 15x^3 - 37x^2 + 36x - 12 = 0$

IV. Writing equations from roots

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

22. 4 **and** $\sqrt{3}$

23. $\sqrt{2}$ **and** $5i$

24. -1 **and** $2i$

25. 2 **and** $1-2\mathrm{i}$