Algebra 2H Common Core Chapter 3 (3.1-3.8) Review

Simplify:

1. $\left(6x^3+3x^2-5x-1\right)-3\left(7x^3+3x-6\right)$ 2. $2x\left(9x^n+5\right)\left(9x^n-5\right)$

3. $(x+1)^2\left(2x^2-3x+1\right)$ 4. $-2x\left(8x^2+3y^2\right)^2$

5. Use Pascal's Triangle to expand and simplify: $\left(2x^2-3y\right)^5$

6. Use polynomial long division to find the quotient: $\left(4x^5-8x^3+4x^2+3x-8\right)\div\left(2x^2-1\right)$

7. Is $-i\sqrt{2}$ a zero of $f(x)=x^4+x^3+2x-4$? Explain your answer.

8. Is $x+4$ a factor of $p(x)=2x^4-x^3-42x^2+16x+120$? Explain your answer.

Factor completely: 9. $512x^{16}-2$ 10. $125x^6+27y^3$

11. $25x^8-110x^4y^3+121y^6$ 12. $(x+2)^4+(x+2)$

Solve over the complex numbers:

13. $2x^4-50=0$ 14. $3x^3=24$ 15. $3x^5-10x^3=8x^3+48x$

Find the zeros of the each function:

16. $f(x)=4x^4-7x^2-36$ 17. $f(x)=15x^3+10x^2-105x-70$

18. Factor $p(x)=2x^3+7x^2-33x-18$, given that $p(-6)=0$.

19. List all possible rational zeros of $p(x)=6x^4-3x^3+x+10$.

20. Given that $\frac{3}{4}$ is a zero of $f(x)=8x^5+30x^4+37x^3+8x^2-26x-12$, find the other zeros.

21. Write the simplest polynomial function that has these zeros: $\frac{-1}{2}$, $3i$, $2+\sqrt{3}$.

22. Describe the end behavior of the function $f(x)=-2x^5+6x^3+x^2-2$.

Write the rule for function $g(x)$.

23. $g(x)$ reflects $f(x)=x^3+2x^2-3x-6$ across the y-axis

24. $g(x)$ translates $f(x)=(x-4)^5-2$ left 6 and up 5

25. $g(x)$ compresses $f(x)=x^3-6$ horizontally by a factor of $\frac{1}{3}$

26. $g(x)$ stretches $f(x)=x^3+2x^2-3x-6$ by a factor of 2 and reflects it across the x-axis

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Selected answers: 1. $-15x^3+3x^2-14x+17$ 2. $162x^{2n+1}-50x$ 3. $2x^4+x^3-3x^2-x+1$

4. $-128x^5-96x^3y-18xy^2$ 5. $32x^{10}-240x^8y+720x^6y^2-1080x^4y^3+810x^2y^4-243y^5$

6. $2x^3-3x+2-\frac{6}{2x^2-1}$ 7. Yes 8. No 9. $2(16x^8+1)(4x^4+1)(2x^2+1)(2x^2-1)$

10. $(5x^2+3y)(25x^4-15x^2y+9y^2)$ 11. $(5x^4-11y^3)^2$ 12. $(x+2)(x+3)(x^2+3x+3)$

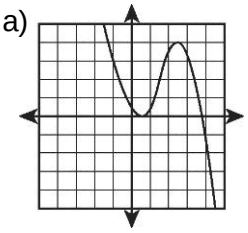
13. $\pm\sqrt{5}$, $\pm i\sqrt{5}$ 14. -2, $-1\pm i\sqrt{3}$ 15. 0, $\pm2\sqrt{2}$, $\pm i\sqrt{2}$ 16. ±2, $\pm\frac{3}{2}i$ 17. $\pm\sqrt{7}$, $\frac{-2}{3}$

18. $p(x)=(x+6)(2x+1)(x-3)$ 20. $\frac{3}{4}$, $\frac{-1}{2}$, -2, $-1\pm i$ 21. $f(x)=2x^5-7x^4+16x^3-62x^2-18x+9$

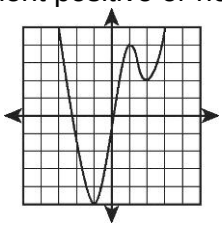
Do problems #27-32 on this page.

27. Is the function even or odd? Is the leading coefficient positive or negative?

a)

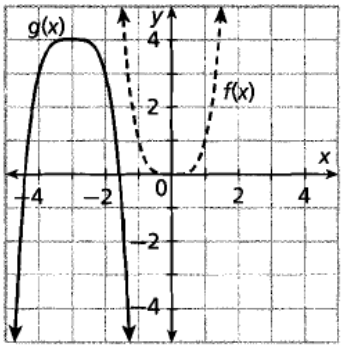


b)

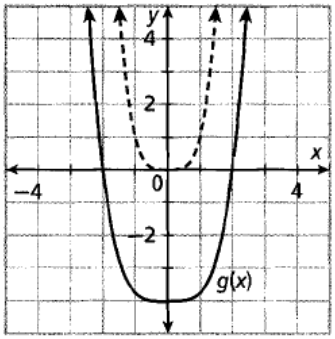


28. The graph of $g(x)$ is the graph of $f(x) = x^4$ after a series of transformations. Describe the transformations and write the equation for $g(x)$.

a)

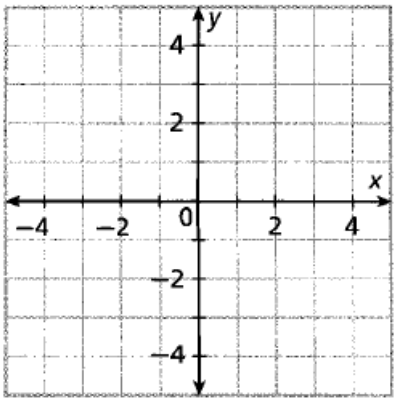


b)

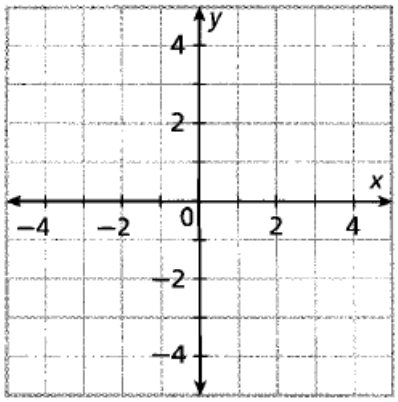


Graph #29-32. For #29 and #30, create an x | y table of values for points between the zeros.

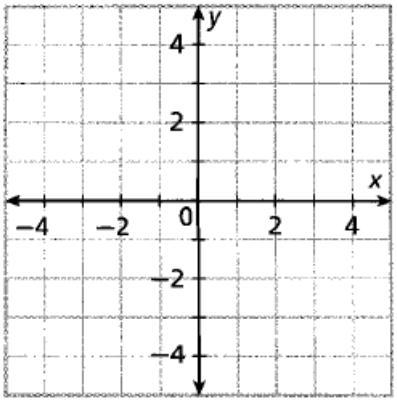
29. $f(x) = \frac{1}{10}(x+3)(x-1)(x-4)$



30. $f(x) = \frac{1}{12}(x+4)(x-3)(x+1)^2$



31. $f(x) = -(x-2)^4 - 1$



32. $f(x) = \frac{1}{2}x^3 + 2$