Key

Honors Algebra 2 Chapter 6 Review

Simplify the following. No negative exponents.

1. $\left(2c^2\right)^2\left(5c^7d^2\right)^0$ $= 4c^4$

2. $\dfrac{6a^4b^6c^2}{48a^6b^3c^5}$ $= \dfrac{b^3}{8a^2c^3}$

3. $\left(6x^2-2x-8\right)-\left(5x^2-2x-7\right)$

x^2-1

4. $\left(\dfrac{3x^3}{y}\right)^{-2}$ $= \dfrac{y^2}{9x^6}$

5. $\left(2x^2-3x+4\right)(x+1)$ $= 2x^3-x^2+x+4$

6. Find $p(-2)$ for $p(x)=-2x^2+3x-1$. -15

7. Find $f(a-2)$ for $f(x)=4x+7$. $4a-1$

8. Find $4\cdot f(a+2)$ for $f(x)=4x+7$. $16a+60$

9. Give the viewing window you would use to produce a complete graph of $y=x^3-6x^2+4x-4$.

$[-5,10]\times[-25,10]$

10. State the total number of roots (real roots plus non-real roots) for $f(x)=x^3-6x^2+4x-4$

3

11. Find the all the real roots for $f(x)=x^3-6x^2+4x-4$. Approximate the nearest tenth.

$x=5.396$

12. Find the relative extrema for $y=x^3-6x^2+4x-4$. Approximate the nearest tenth.
Make sure you label the type of extrema (i.e., relative maximum or relative minimum).

RMax: $(0.367,-3.291)$ Rmin $(3.633,-20.709)$

13. Give the degree of the polynomial and y-intercept $p(x)=3x^5-2x+5$.

5th degree y-int = 5

14. Solve: $x^3-64=0$

$x=4$ $x=-2\pm 2i\sqrt{3}$

15. Solve: $x-4\sqrt{x}=21$

$x=49$

16. Use synthetic substitution to find $f(3)$ for $f(x)=7x^3-2x^2-0.125x+7.378$.

$f(3)=178.003$

17. Is $4x-3$ a factor of $4x^3-3x^2+16x-12$? Yes; remainder = 0

18. One of the factors of $x^3+x^2-14x-24$ is $x-4$. Find the remaining factors of the polynomial.

$(x-4)(x+3)(x+2)$

19. Find the roots for the function given one root. $f(x)=x^3-2x^2+9x-18$; 2

$x=2$ $x=\pm 3i$

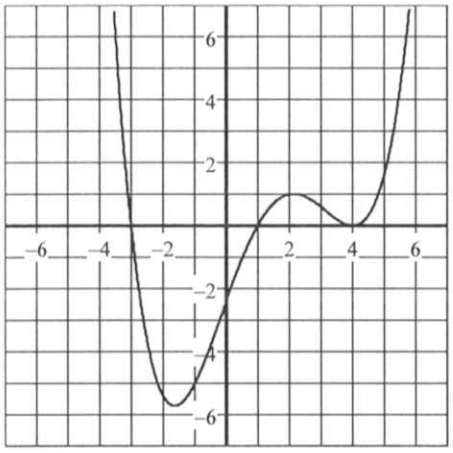
20. Find the roots of the function given one factor. $f(x)=4x^3-12x^2+x-3$; $x-3$

$x=3$ $x=\pm\frac{1}{2}i$

21. Write a polynomial function of least degree with integral coefficients that has the given zeros. –4; $1+i$

$f(x)=x^3+2x^2-6x+8$

Use the following graph for questions 22 – 26



22. Is the graphed function an odd degree polynomial or even degree polynomial? Even

23. What is the maximum degree for the polynomial graphed? 4th

24. Describe the end behavior.
$x \to \infty : y \to$ ∞
$x \to -\infty : y \to$ ∞

25. Is the leading coefficient positive or negative? +

26. Find a polynomial (in factored form) for the graph given, knowing that it passes through the point $(2,1)$. $f(x) = \frac{1}{20}(x+3)(x-1)(x-4)^2$

For questions 27 –29 use the following material.

Before any amusement park is built, park owners examine information about the people that they expect to come to the park. This requires the study of demographics or population statistics. A demographer is a scientist who collects and interprets data about populations.

The following table lists the actual and predicted percent of the U.S. population between ages 18 and 24 years.

Year	1960	1970	1980	1990	2000	2010	2020	2030
% of Population	8.9	12.1	13.3	10.4	9.4	9.6	8.5	8.4

A demographer might model the relationship by using an approximate polynomial. For this problem, let 1960 be year 0. Then 1970 is year 10, 1980 is year 20, and so on.

27. Find the following functions: (**Do not** round the coefficients.) Beware scientific notation.

a. Cubic Function: $y = 1.09596 * 10^{-4} x^3 - 0.013055194 8x^2 + 0.3697222222x + 9.240909091$

b. Quartic Function: $y = -3.522727 * 10^{-6} x^4 + 6.02777778 * 10^{-4} x^3 - 0.034443181 8x^2 + 0.6585858586x + 8.818181818 18$

28. Suppose the demographer chose to use the quartic function. Use your calculator to estimate to the nearest hundredth of a percent, the percent of the U.S. population (between the ages of 18 and 24) in the year 2012.

8.93%

29. Suppose the demographer chose to use the quartic function. Use your calculator to find the approximate year the percent of the US population between the ages of 18 and 24 will be at 8%.

2032