

Math 3200 Review- Chapter 3 Polynomials

1. What is the leading coefficient for the polynomial  $P(x) = -2(3-x)^2(1+2x)$ ?  $-4$

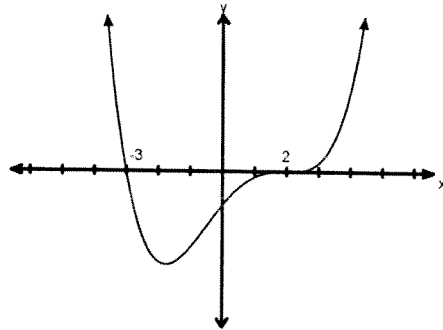
2. What is the degree of the polynomial in #1?  $3$

3. Solve for x:  $-2x(x+5)^2(2x-7) = 0$   $x = 0, -5, 7/2$

4. What are the x-intercepts for the function  $f(x) = x^2 - 3$ ?  $x = \pm\sqrt{3}$

5. What is the y-intercept for the function  $f(x) = (x-3)(2x-5) + 7$ ?  $22$

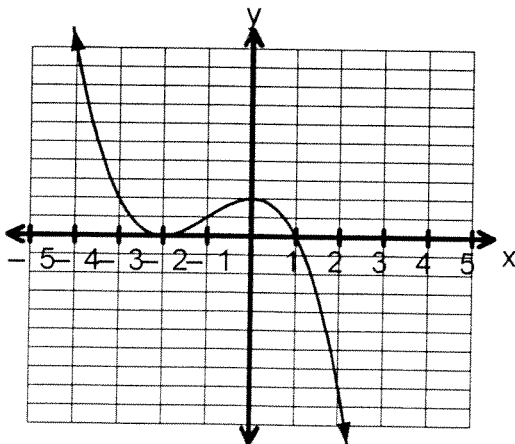
6. What is the equation for the quartic below? The y-intercept is  $(0, -1)$



$$y = \frac{1}{24}(x+3)(x-2)^3$$

7. What is the quotient when  $P(x) = 3x^3 - 7x^2 + 8x - 2$  is divided by  $(x+1)$ ?  $x^2 - 10x + 18$

8. On what interval(s) is  $f(x)$  negative?



$$x > 1$$

or

$$(1, \infty)$$

11. What type of polynomial has at most four different single roots?

quartic

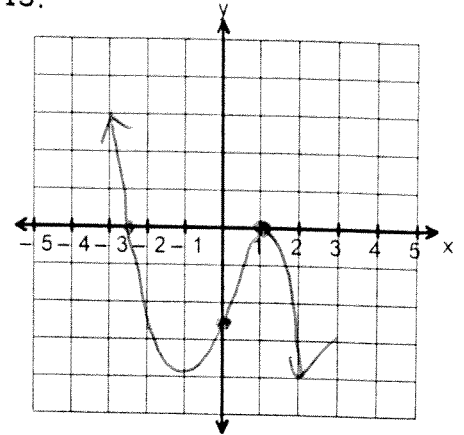
12. Sketch the following function without using your graphing calculator.

$$f(x) = -\frac{1}{2}(1-x)^2(2x+5)$$

$$x = -5/2, 1$$

$$y_{\text{max}} = -2.5$$

13.



13. Completely factor the polynomial:  $8x^4 + 8x^3 - x - 1$

14. Find the remainder when  $P(x) = 2x^{50} - 7$  is divided by  $(x+1)$   $-5$

15. List the possible factors for  $P(x) = 2x^3 - 3x^2 + 4x - 6$ .  $16 \pm 1, \pm 2, \pm 3, \pm 6$

16. If  $P(-5) = 0$ , then what binomial must be a factor of  $P(x)$ ?  $x+5$

17. Find  $P(-2) = 0$ , then \_\_\_\_\_ must be an x-intercept of the graph of  $P(x)$ .  $x = -2$

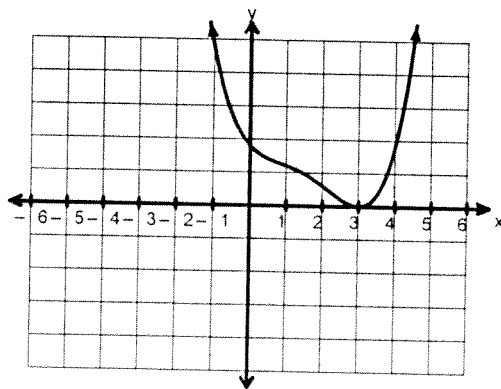
18. If  $(x+2)$  is a factor of  $3x^3 + kx^2 - 31x - 54$ , then find the value of  $k$ .  $k = 4$

19. The graph of the polynomial  $P(x) = a(x-2)(3x+4)(x+1)$  passes through the point  $(-2, 16)$ . Find the value of "a".  $a = -2$

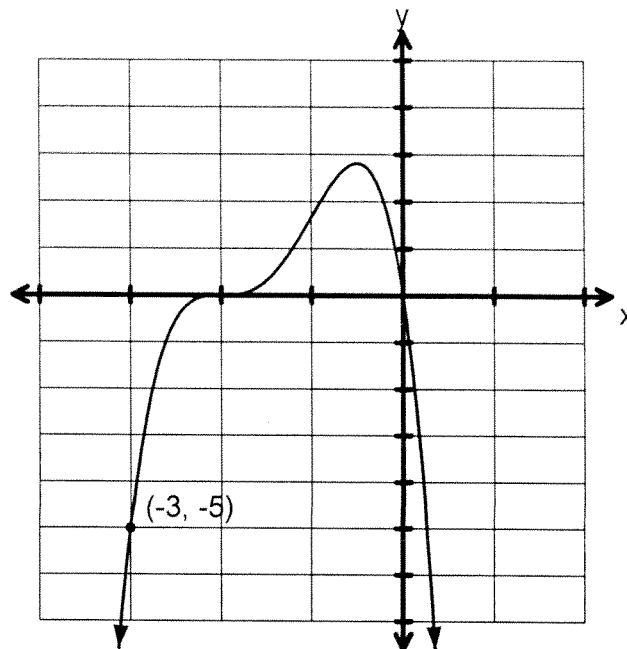
20. Solve for  $x$ :  $x^2 + 5x - 6 = 0$   $x = -6, 1$

21. What kind of root does the quartic graphed below have at 3?

multiplicity of 2



22. Find an equation for the quartic graph



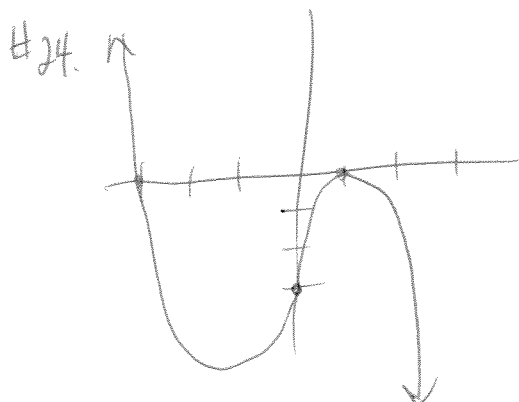
$$y = -\frac{5}{3}x(x+2)^3$$

23. Use the INTEGRAL ROOTS thrm to algebraically solve the polynomial equation:  
 $x^3 - 7x + 6 = 0$ .

24. Without using your graphing calculator, sketch the graph of  $f(x) = -x^3 - x^2 + 5x - 3$ .

25. An interlocking stone path that is  $x$  ft wide is built around a rectangular garden. The garden is 20 ft wide by 40 ft long. The combined surface area of the garden and the pathway is  $1196 \text{ ft}^2$ . What is the width of the stone pathway? Solve algebraically and show all workings.

#23.  $x = 1, x = -3, x = 2$



#25.  $x = 3$