Precalculus

2.1-2.4 Test Review

Name_____

Period_____Date_____

Find the vertex.

1. $f(x) = -2x^2 + 12x - 18$	2. $f(x) = -2(4x - 12)^2 + 5$
3. $f(x) = x^2 + 16x + 61$	4. $f(x) = \frac{1}{2}(5x + 10)^2$

Write the quadratic equation with the given vertex which passes through the given point.

5. Vertex: $(-2, 5)$; Point: $(0, 9)$	6. Vertex: $(-3, -10)$; Point: $(0, 8)$
7. Vertex: $(1, -2)$; Point: $(-1, 14)$	8. Vertex: $(2, 3)$; Point: $(0, 2)$

Find the $x - intercepts$.

9. $f(x) = 21x^2 + 29x - 10$	10. $f(x) = -x^2 + 2x + 5$
11. $f(x) = 8x^2 + 34x - 9$	12. $f(x) = x^2 + 10x + 14$

13. Determine the left-hand and right-hand end behavior of : $f(x) = x^5 + 3000000000x^2 + 10$

14. Determine the end behavior of $f(x) = -3x^{4000} - 6x^2 + 4$

15. What is the multiplicity of the zero $x = 5$ in the function $f(x) = x^3(x - 5)^4(x - 2)^2$

16. State the degree of the given polynomial. $f(x) = -3x^2(x - 2)^3(x + 4)(x - 1)^4$

17. State the maximum number of zeros for the polynomial $f(x) = -3x^6 + x^4 - 2x + 10$

18. State the maximum number of turning points for the polynomial $f(x) = 8x^5 + 3x^4 - 6x^2$

19. When using synthetic division the remainders from using -2 and 5 as inputs are 1 and -8 respectively. Which of the following would be the best choice to use as input in order to find the zeros of the function?

      a. -6 b. 3   c. 6   d. -10 e. None of these

20.   The following table shows there are at least how many real zeros?

x	$f(x)$
2.1	$-.0006$
2.2	.00059
2.3	.00073
2.4	$-.0007$
2.5	$-.0017$
2.6	.00194
2.7	.01702

21. Which of the following are true given the following synthetic division?

   I. $f(3)=0$ II. x-int$:(-3,0)$ III. $x+3$ is a factor

-3	3	2	-10	33
		-9	21	-33
	3	-7	11	0

22. If the polynomial $g(x) = (x + 4)^2(x - 3)(x + 1)$ is divided by the polynomial $f(x) = x - 7$, then what is the degree of the quotient?

23. Given: $10 - 2i$ Name its complex conjugate.	24. Simplify: $\left(3\sqrt{-4}\right)^2$
25. Simplify: $-4(2 + 6i) - (2 + 11i)$	26. Write the expression in the form $a + bi$ $\dfrac{2 + 3i}{6i}$
27. Write the expression in the form $a + bi$ $\dfrac{5 - 2i}{i}$	28. Write the expression in the form $a + bi$ $\dfrac{1+3i}{3-6i}$
29. Write the expression in the form $a + bi$ $\dfrac{6 - i}{3 - i}$	30. Simplify: $-5(2 + i)^2$

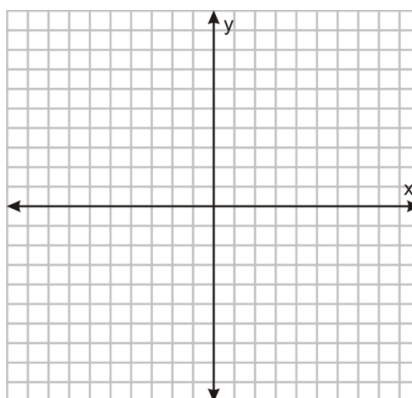Graph the following quadratic. (show at least 7 points)
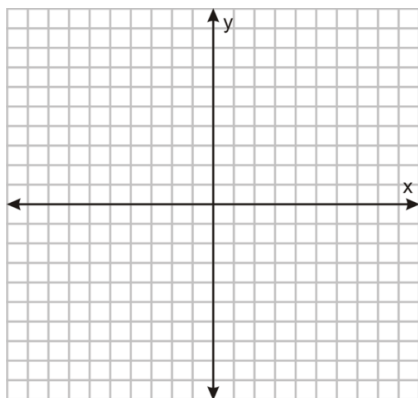
31. $y = -(2x - 8)^2 + 5$	32. $y = [\frac{1}{2}(x - 1)]^2 - 4$
Vertex:_____	Vertex:_____
Axis of symmetry:_____	Axis of symmetry:_____

Write the polynomial with the given zeros.

33. $x = 1, -2, 5$	34. $x = -2, -4, 2, 4$

35.   Divide: $\left(6x^4 + 30x^3 + 26x^2 - 2x - 90\right) \div \left(2x^2 + 4x + 6\right)$

36. Show that $(x + 2)$ and $(x - 3)$ are factors of:

$f(x) = x^4 - 4x^3 - 7x^2 + 22x + 24$, then find the remaining zeros by using synthetic division.

37. Show that $(x + 1)$ and $(x - 1)$ are factors of:

$f(x) = x^4 + x^3 + x^2 - x - 2$, then find the remaining zeros by using synthetic division.