Ch. 7-10 Take Home Test

Due: 5-8-2008 Name_____

(SHOW ALL YOUR WORK AND ANSWERS ON A SEPARATE SHEET OF PAPER)

Classify each polynomial by degree and by number of terms.

1) $10x^3 + 6x^7 - 15x$

2) $\frac{x^3}{11} + \frac{x^2}{8}$

Evaluate each polynomial expression for the indicated value of x.

3) $4 - 2x + 3x^2 - x^4$ *for x = -1*

4) $x^4 - 3x^3 + 3x^2 - 9$ *for x = 3*

Write each sum of difference as a polynomial expression in standard form.

5) $(7x^4 - 3x^3 + 5x) - (2x^4 + x^3 + x^2 + 3x - 2)$

6) $(3x^5 - 4x^2 + 2x^3) + (4x^4 + 3x^3 - 9x^2 - 7)$

Write each product as a polynomial in standard form.

7) $(2x - 3)(x + 4)^2$

8) $(2x - 1)^3$

Use long division for the following:

9) $2x - 3\overline{)2x^3 + 3x^2 - 6x - 3}$

10) $x - 4\overline{)x^2 - 27x + x^3 + 28}$

Factor Completely using method of choice.

11) $x^3 + 3x^2 - 10x = 0$

12) $x^3 - 77x + 4x^2 = 0$

Find all zeros of each polynomial function.

13) $f(x) = x^3 - x^2 - 7x + 3$

14) $g(x) = x^4 - 5x^2 - 24$

Use variable substitution and factoring to find all of the roots of each equation.

15) $x^4 - 14x^2 + 45 = 0$

16) $x^4 + 33 = 14x^2$

Graph each function.

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

18) $g(x) = -2x^3 + 3x - 1$

Graph each rational function. Label all intercepts, asymptotes, maxes, mins. and holes.

19) $m(x) = \dfrac{x+4}{x-4}$

20) $p(x) = \dfrac{x-1}{x^2 - 5x + 4}$

Simplify each product or quotient.

21) $\dfrac{3x^2 + 10x - 8}{3x^2 - 17x + 10} \bullet \dfrac{5 + 9x - 2x^2}{x^2 + 3x - 4}$

22) $\dfrac{3x^2 + 14x - 5}{x^2 + 2x - 15} \div \dfrac{3x^2 - 25x + 8}{8 + 15x - 2x^2}$

Simplify each sum or difference.

23) $\dfrac{3x - 10}{x^2 + 4x - 12} - \dfrac{2}{x+6}$

24) $\dfrac{2x+1}{5-x} + \dfrac{1}{3x+2}$

Solve each equation.

25) $\dfrac{3}{x-2}+\dfrac{5}{x+2}=\dfrac{4x^2}{x^2-4}$

26) $\dfrac{x-2}{x+1}=\dfrac{x-3}{x^2-5x-6}-\dfrac{2x-7}{x-6}$

Graph each rational inequality.

27) $\dfrac{3x+2}{2x}<1$

28) $\dfrac{2}{x}>x^2+1$

Evaluate each expression.

29) $\dfrac{3}{2}\left(\sqrt[3]{-1000}\right)^2$

30) $3\left(\sqrt[3]{125}+3\right)^{\frac{1}{3}}$

Find the domain of each radical function.

31) $f(x)=\sqrt{3x+6}$

32) $f(x)=\sqrt{x^2+2x+1}$

Graph each function and its inverse.

33) $y = x^2 + 4$

34) $y = x^2 - 6x + 9$

Simplify each product or quotient.

35) $\sqrt[3]{4x^5} \bullet \sqrt[3]{54xy^2}$

36) $\dfrac{\sqrt{9x^7}}{\left(12x^5\right)^{\frac{1}{2}}}$

Find each sum, difference or product of sum and differences.

37) $7\sqrt{20} + 8\sqrt{5} - 2\sqrt{45}$

38) $6\sqrt{8} - \left(\sqrt{24} - 3\sqrt{72} + \sqrt{54}\right)$

Write each expression with a rational denominator and in simplest form.

39) $\dfrac{5}{1-\sqrt{6}}$

40) $\dfrac{2\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}}$

Solve each rational expression.

41) $\sqrt{3x - 5} = 5$

42) $\sqrt{5x - 11} = x - 1$

Solve each rational inequality.

43) $3 \geq \sqrt{x^2 - 4x + 4}$

45. Graph the parabola and label the vertex, focus and directrix

$$y=\frac{1}{16}(x+1)^2+2$$

46. Write the equation for a parabola in graphing form, $y=\frac{1}{4p}(x-h)^2+k$ with a vertex at (1, 2) and a focus at (1, 0).

47. Graph the circle and label the center and radius

$$(x-5)^2+(y-1)^2=36$$

48. Convert the standard form of an equation of a circle into the graphing form, $(x-h)^2+(y-k)^2=r^2$

$$x^2+y^2+6x+4y+12=0$$

49. Graph the ellipse and label the center, vertices and foci.

$$\frac{(x-2)^2}{16}+\frac{(y-1)^2}{36}=1$$

50. Write the equation for an ellipse in graphing form, $\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$ with a foci at (0, -3) and (0, 3) and co-vertices at (-4, 0) and (4, 0)

51. Graph the hyperbola and label the center, vertices and foci.

$$\frac{(x-3)^2}{16}-\frac{(y-1)^2}{9}=1$$

52. Convert the standard form of an equation of a hyperbola into the graphing form, $\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$

$$7x^2-5y^2=48-20y-14x$$

Find the probability of each event.

53) Drawing a red marble from a bag that contains 3 red marbles and 5 purple marbles.

54) An odd number or a number greater than 4 will appear after rolling a number cube once.

Find the probability of each event for one roll of a number cube.

55) 5, given that it is an odd number.

56) 2, given that it is less than or equal to 5.

Find the number of permutations.

57) Find the number of ways that a coach can assign 8 basketball players to 5 distinct positions.

58) In how many ways can 5 children be positioned around a merry-go-round?

Find the number of combinations.

59) Find the number of ways to choose 2 books from a set of 10 books.

60) In how many ways can 3 student representatives be chosen from 100 students?

Find the probability of independent events.

61) Find the probability of getting 3 heads on 3 tosses of a fair coin.

62) Find the probability of drawing a card greater than 5 from a standard deck of cards. (Ace is a 1).