**Pre-Calculus Honors Midterm Exam Dates: 1st – 10/16 F, 3rd – 10/20 T, 4th – 10/21**

**Midterm Study Guide**



|  |  |
| --- | --- |
| x | g(x) |
| 0 | -3 |
| 1 | -5 |
| 2 | 7 |
| 3 | 1 |

**Objective 1.1:** Evaluate

1.) If f(x) = 3x2 - 4x, f(3b) =

2.) Given the table at right, g(1 + 2) + 2 =

3.) Given h(x) at right, h(3) + h(-3) =

**Objective 1.2:** Write the following inequalities in interval notation (graph them on a number line first!)

4.) x > - 4, x < 3 5.)  6.) x > -1 and x < 3 or x > 6

**Objective 1.3:** Find the following for the function at right:

7.) Domain: Range:

8.) Increasing: Decreasing:

9.) Even? Odd? Neither?

10.) Extrema:

**Objective 1.4:** (Tip: Memorize your parent functions! Make flash cards!)

11.) Which parent functions are increasing everywhere?

12.) Which parent functions have domain (-∞, ∞)?

13.) Which parent functions have minimums/maximums?

**Objective 1.5:** Find the domain of the following functions:

14.) f(x) = (x + 4)/(x2 + 8x + 15) 15.) g(x) = 3x2 + √(4 – x) 16.) h(x) = √(x – 1)/(x2 – 4)

**Objective 1.6:**

|  |  |
| --- | --- |
| Age (months) | Weight (lbs) |
| 18 | 23 |
| 20 | 25 |
| 24 | 24 |
| 26 | 32 |
| 27 | 33 |
| 29 | 29 |
| 34 | 35 |
| 39 | 39 |
| 42 | 44 |

A group of male children were weighed. Their ages and weights are recorded below.

17.) Based on this data (it will help to plot it), what might be an appropriate regression to model this function?

18.) Find the linear regression.

19.) What is the slope in your linear regression and what is its meaning?

20.)How much should a 36 month old weigh?

21.) Does some other regression fit the data better? How do you know?

**Objective 1.7:** Write the new function given the transformations

22.)  stretched vertically by 2, shifted 3 units right, and 1 unit down

23.)  shifted 5 units left, 3 units down and then flipped horizontally

24.)  shifted 2 units up, shifted 3 units right, shrunk horizontally by a factor of 1/3

**Objective 1.8:** If , , and , evaluate the following

25.) f(g(x)) 26.) g(f(2)) 27.) (g – h)(x)

**Objective 1.10:** If f(x) = , evaluate:

28.) f(-1) = 29.) f(3) = 30.) f(5) =

**2.1 Polynomial Zeros and 2.2 & 2.3 Creating Polynomials:**

31. What could the equation of the following polynomial be?

32. Find a polynomial whose zeros include at -2, 3, and c that crosses the x-axis at -2 and c, but touches the axis at 3.

33. What is the minimum possible degree of the function in question 8, based on the characteristics given?

34. What are the zeros of f(x) = 3x3 - 15x2 - 6x – 72?

35. The following polynomial could be what degree:

**2.4 Polynomial division. Divide:**

36.  37. 

**2.5 Polynomial Application:**

Jarod is working as an Engineer. He completes the structural specifications for a 225-ft long steel beam, anchored between two pilings. He knows that when a 250-lb object is placed d feet from the west piling, the beam bends s feet, where s = (8.5 \* 10-7) d2 (225 – d). Use the window [-10, 235] by [-1, 3]

38. What is the greatest amount the beam bends, and what distance gives this bend?

39. Where could the object be placed to cause a bend of 1.5 ft?

40. What values of d make sense for this problem? Why?



**2.6-2.7 Graphing Rational Functions:**

Find the following and graph: f(x) =

41. Domain:

43. Hole(s):

44. Vertical Asymptote(s):

42. End Behavior Asymptote:

45. x and y intercepts: