M119 Review*TEST* #1 Vernia

NAME:_____

Compute the indicated values of the given function (problems 1-3).

1. $f(x) = 3x^2 + x - 5$; $f(0)$, $f(-1)$

2. $g(u) = (u+1)^{\frac{3}{4}}$; $g(15)$, $g(-1)$

3. $f(x) = \begin{cases} 2 & \text{if } x < -3 \\ x-1 & \text{if } -3 \leq x \leq 2 \\ x^{\frac{1}{2}} & \text{if } x > 2 \end{cases}$, f(-7), f(0)

Find the domain of the following functions (problems 4-6).

4. $f(x) = \frac{11}{x+2}$

5. $f(x) = 2x^3 - 5x + 1$

6. $f(x) = \sqrt{3x+5}$

7. Find the composite function f(g(x)) when $f(u) = u^2 + 2u - 3$ and $g(x) = x + 1$. *Simplify your answer.*

Graph the following functions. Include all x and y intercepts. (problems 8-11).

8. $f(x) = x^2 + 1$

9. $f(x) = \frac{2}{3}x - 2$

10. $f(x) = 4$

11. $f(x) = \begin{cases} x+2 & if\ x \leq 3 \\ x-1 & if\ x > 3 \end{cases}$

12. Find the slope of the line that passes through the points $(2, -3)$ and $(-2, -1)$.

13. Find the equation of the line that has a slope of $-\frac{1}{3}$ and a y-intercept of -4.

14. Find the equation for the line that passes through the points $(3, -7)$ and $(-1, -7)$.

15. Find the equation for the line that passes through the point $(-1,2)$ with slope $\frac{1}{2}$.

16. Find the equation for the line that passes through (1,2) that is parallel to the x-axis.

17. Find the equation for the line that passes through (1,4) perpendicular to the line : $y = -\frac{2}{3}x - 4$

18. A home owner wishes to make a rectangular garden that is three times as long as it is wide. Express the square footage of the garden as a function of its width.

19. A closed box with a square base is to have a **volume** of 1, 000 square inches. Express its **surface area** as a function of the **length of its base.**

20. A manufacturer of chairs can sell them for \$150 a piece. Total cost consists of a fixed overhead of \$7,490 plus production costs of \$80 per chair. How many chairs must the manufacturer sell to break even?

21. A products supply and demand functions are given as $s(x) = 2x + 110$ and d(x) = -3x+290. When does market equilibrium occur?

An environmental study of a certain community suggests that the average daily level of carbon monoxide in the air will be c(p) = 0.5p+1 parts per million when the population is p thousand. It is estimated that t years from now the population of the community will be $p(t) = 10 + 0.1t^2$ thousand. (Use this information for problems 22 & 23)

22. Express the level of carbon monoxide in the air as a function of time.

23. What will the carbon monoxide level be in 4 years?

Suppose the total cost in dollars of manufacturing q units of a certain commodity is given by the function C(q) = $q^3 - 30q^2 + 500q + 200$. (Use this info. For problems 24 & 25)

24. Compute the cost of manufacturing 10 units of the commodity.

25. Compute the cost of manufacturing the 10th unit of the commodity.

ANSWERS:

1. f(o) = -5 f(-1) = -3 2. g(15) = 8 g(-1) = 0 3. f(-7) = 2 f(0) = -1

4. x $\neq$ -2 5. All real numbers 6. x $\geq -\frac{5}{3}$ 7. $f(g(x)) = x^2 + 4x$

12. $m = -\frac{1}{2}$ 13. $y = -\frac{1}{3}x - 4$ 14. $y = -7$

15. $y = \frac{1}{2}x + \frac{5}{2}$ 16. $y = 2$ 17. $y = \frac{3}{2}x + \frac{5}{2}$ 18. $S(w) = 3w^2$

19. $S(x) = 2x^2 + \frac{4000}{x}$ 20. $107\ units$ 21. $at\ x = 36\ units$

22. $C(p(t)) = 6 + .05t^2$ 23. $6.8ppm$ 24. \$3,200 25. \$201