EXAM #1A
MATH 142-Drost
4 points/problem

Name: _____
SS # _____
Score: _____

_____1. Find the domain of the function $f(x) = \sqrt{x^2 - 9}$

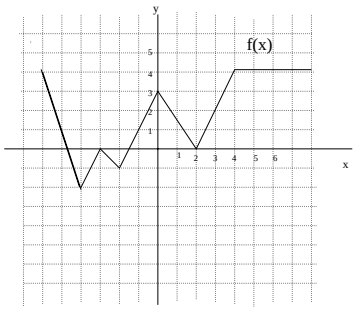
a) $(-\infty, -9], [9, \infty)$ b) $(-\infty, -3], [3, \infty)$ c) $[-3, 3]$ d) $[-9, 9]$

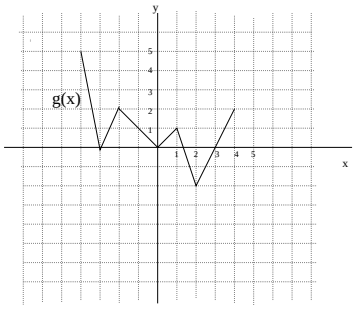
e) none of these

_____2. Given $f(x)$ and $g(x)$ as shown below: find $(f \circ g)(2)$

a) 0 b) 2 c) -2 d) -1

e) none of these





Questions 3-5 are all about Star Electronics, whose only product is TV's.

_____3. Star Electronics has total costs of \$180,000 to produce 35 TV's. They have fixed costs of \$106,500. Find the cost equation given x = the number of TV's produced.

a) $C(x) = 35x + 106,500$ b) $C(x) = 35x + 180,000$

c) $C(x) = 2100x + 180,000$ d) $C(x) = 2100x + 106,500$

e) none of these

_____4. Star Electronics sells all they produce at \$2650 each. Write a profit equation.

a) $P(x) = 550x - 106,500$ b) $P(x) = 550x + 106,500$ c) $P(x) = 2650x$

d) $P(x) = 2650x - 180,000$ e) none of these

_____5. Find the profit or loss when Star Electronics makes and sells 193 TV's.

a) loss of \$200 b) loss of \$350 c) profit of \$200 d) profit of \$350

e) none of these

Given the following data where x = the age of the child in years and y = the weight of the child (in pounds)

x	5	7	8	9	11	13	15
y	45	58	67	86	98	105	120

_____6. Find the best fitting straight line and the correlation coefficient. _____

_____7. What does this model predict the weight of the child will be at 10 yrs old? _____

_____8. What does this model predict the age of the child is whose weight is 75 lbs? _____

_____9. Find the vertex of: $f(x) = 2x^2 - 12x + 5$

a) $(6, 5)$ b) $(3, -13)$ c) $(2, -11)$ d) $(5, -5)$

e) none of these

_____10. Solve $8^x = 16^{3+x}$

_____11. Solve $\log_2 (\log_4\ x) = 0$

_____12. Solve $2^x(x^2 - x - 2) = 0$

_____13. Complete the square (showing all steps) for $f(x) = 3x^2 + 12\alpha x + 4\beta$. Describe the graph of $f(x)$.

Problems 14-16: A local travel agent is offering travel packages to Omaha. The minimum number of Aggies is 400, and the maximum is 1200. If 400 Aggies sign up, the cost if \$800 per student. The price per student is reduced 50 cents for each additional student over the 400 minimum.

_____14. Find the demand equation $p = mx + b$ where x is the number of Aggies on the trip.

_____15. Write the revenue equation.

_____16. How many people should they take to maximize revenue?

_____17. What is the effective yield for Bank A which offers 6% compounded weekly? (round your answer to 2 decimal places) _____

_____18. If \$2500 is invested at $6\frac{3}{4}\%$ compounded monthly for seven years, what will the balance be (assuming no withdrawals)? _____

_____19. Which of the following are polynomials: _____

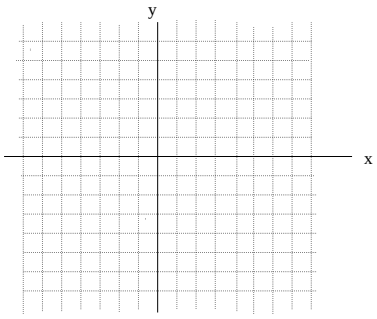
a) $f(x) = 3x^2 + \pi x + 7$ b) $g(x) = 7x - \dfrac{4}{x}$ c) $h(x) = 3x^4 - 2x^{\frac{3}{2}} + 5$

_____20. Describe the graph of $f(x) = \dfrac{1}{2}(x - A)^2 + B$

_____21. True or False: $\log 3x^2 = 2 \log 3x$

_____22. Find the difference quotient: $\dfrac{f(x+h) - f(x)}{h}$ for $f(x) = x^2 + x$

_____23. $f(x) = \begin{cases} \mid x + 1 \mid & , x < 0 \\ 2 - 4x & , x \geq 0 \end{cases}$



a) Graph the piecewise function f(x)

b) where is f(x) increasing _____, decreasing _____

_____24. Simplify: $\log_3 81 - e^{2\ln 3} + \log 1$

_____25. If $f(x) = \sqrt{3x+1}$, find $f(x-2)$

_____26. Given x = the number of items produced, and y = the total costs of production.
Find the best-fitting model among: linear, quadratic, cubic, and exponential
Which is the best model and why?

x	5	15	34	52	81
y	80	700	3850	6200	22400