The best 20 of these 21 problems will count 5 points each
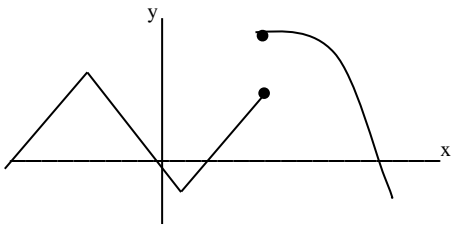
1. Is the relation $\{(-3, 4), (-2, -2), (1, 8), (3, 8), (7, 13)\}$ a function? Why or why not?

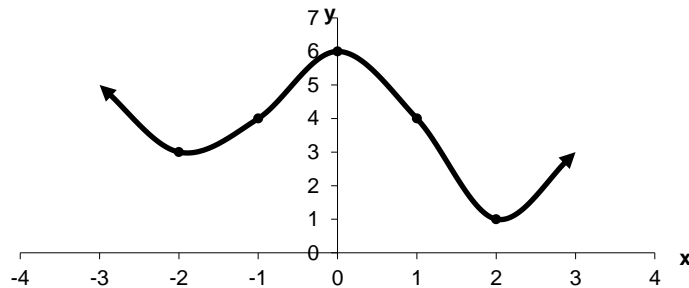2. If $f(x) = 5x^2 + 7x + 1$ find $f(2x + 3)$ [SET UP ONLY]

3. Graph $f(x) = \begin{cases} x^2 & -3 \le x < 1 \\ 3x - 1 & x \ge 1 \end{cases}$

4. What is the domain for $y = \dfrac{3x - 2}{x^2 - 7x + 12}$?

5. Is the following a function? Why or why not?

6. Given the graph below give the intervals the graph is increasing and decreasing. Also give the local maximum and minimum.

7. Explain whether $y = x^4 + 2x^2$ is an even or odd function.

8. Graph $y = |x - 3|$

9. Graph $y = (x + 1)^3$

10. Graph $y = x^2 - 4$

11. Graph $y = x^2 - 6x + 5$

12. Solve by using the **substitution** method $4x + 3y = 10$
                                                    $3x - y = 1$

13. Solve by using the **elimination** method (addition/subtraction)

                    $3x - 4y = 7$
                    $2x + 3y = 16$

14. Mr. Smith wants to make a mixture of nuts to sell for $7.50 per pound. He mixes some
    of nut A which sells for $5 per pound and some of nut B that sells for $8 per pound.
    How many pounds of each type of nut should be used if there is to be 120 pounds of mixture?

15. Graph $x + 2y < 8$

16. Graph the solution to the system of inequalities $\mathbf{x \geq 0, \; y \geq 0, \;\; x + y \leq 6, \;\; y \geq x + 2}$

17. Using your information from problem 16 Maximize $\mathbf{C = 5x + 2y}$

If you did not do Problem 16 then use the following random ordered pairs
{ (0, 2) (2, 4) (3, 6) (4, 7) }

18. Find $f^{-1}(x)$ if $f(x) = \sqrt[5]{x-4} + 2$

19. Graph the exponential function: $y = 2^{-x}$

20. How much interest is earned if $125,000 is compounded quarterly at 2% compounded quarterly for 10 years?

21. How much is $250,000 worth if compounded continuously at 2.25% for nine years?

Formulas:

$\mathbf{x = -b/2a}$ $\mathbf{A = P(1 + r/n)^{nt}}$ $\mathbf{A = Pe^{rt}}$ $\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$