Homework – Chapter 1 (Finney, Demana, Waits, Kennedy)
Show all work on a separate paper. You may only use a calculator on problems where permission is given. Occasionally I will emphasize to NOT use a calculator even though this rule carries through the assignment!!!

Section 1.1
1.   Find the coordinate increments from A to B. *(This is simply asking you to find how much x changes and how much y changes)*
        A.   (1, 2)   B.   (-1, -1)

11.   Write an equation for (1) the vertical line and (b) the horizontal line through the point P.
        $P(0, -\sqrt{2})$

13. (alternative). Write the equation of the line that passes through (1, 1) and m = 1 in the following forms:
        Point-slope:
        Slope-intercept:
        Intercept:
        General:

23 (alternative). Write the equation of the line that passes through (-2, 0) and (-2, -2) in the following forms:
        Point-slope:
        Slope-intercept:
        Intercept:
        General:

31.   Write an equation for the line through P that is (a) parallel to L and (b) perpendicular to L
        P(0, 0). L: y = -x + 2

35.   Use the table of values given for a linear function f(x) = mx + b. Determine m and b.

x	f(x)
1	2
3	9
5	16

37.   Find the value of y for which the line through A and B has the given slope m.
        A: (-2, 3)   B: (4, y)   m = -2/3

41.   For what value of k are the two lines 2x + ky = 3 and x + y = 1 (a) parallel and (b) perpendicular

47.   The slope of a vertical line is 0. True or false? Justify your answer

48.   The slope of a line perpendicular to the line y = mx + b is 1/m. True or false? Justify your answer.

51.   What is the x-intercept of the line y = 2x – 5

Section 1.2

QR3.   Solve for x. $|x - 3| \leq 4$

QR6.   Solve for x. $9 - x^2 \geq 0$

QR9.   Find all real solutions to the equation. $f(x) = x^2 - 5$
        (a)   f(x) = 4   (b)   f(x) = -6

QR10.   Find all real solutions to the equation. $f(x) = \frac{1}{x}$
        (a)   f(x) = -5   (b) f(x) = 0

QR12.   Find all real solutions to the equation. $f(x) = \sqrt[3]{x - 1}$
        (a)   f(x) = -2   (b) f(x) = 3

6.   Identify the domain and range. Again - Show all work – including the work to find range.
$y = x^2 - 9$.

9.   Identify the domain and range. Again - Show all work – including the work to find range.
$y = \frac{1}{x-2}$

12.   Identify the domain and range. Again - Show all work – including the work to find range.
$y = 1 + \frac{1}{x^2}$

16.   Sketch the graph of the equation (You may use your calculator). Identify the domain and range using the graph.
$y = \sqrt{9 - x^2}$

17.   Sketch the graph of the equation (You may use your calculator). Identify the domain and range using the graph.
$y = x^{\frac{2}{5}}$

18.   Sketch the graph of the equation (You may use your calculator). Identify the domain and range using the graph.
$y = x^{\frac{3}{2}}$

31.   Graph, without the use of a calculator, the piecewise function:
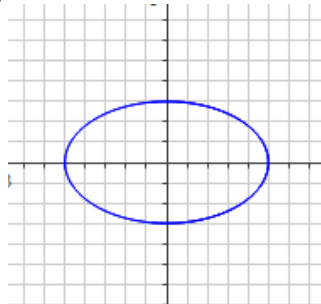$f(x) = \begin{cases} 3 - x, & x \le 1 \\ 2x, & 1 < x \end{cases}$

32.   Graph, without the use of a calculator, the piecewise function:
$f(x) = \begin{cases} 1, & x \le 1 \\ \sqrt{x}, & 1 < x \end{cases}$

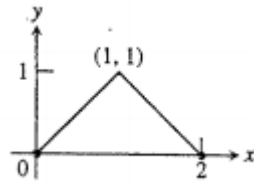34.   Graph, without the use of a calculator, the piecewise function:
$f(x) = \begin{cases} x^2, & x < 0 \\ x^3, & 0 \le x \le 1 \\ 2x - 1, & x > 1 \end{cases}$
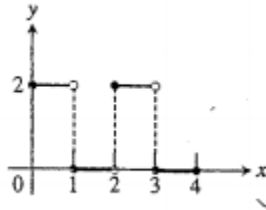
37.   Is this a function? Explain in a sentence or two –
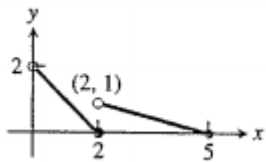
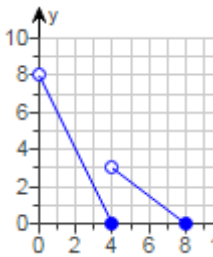41.   Write a piecewise formula for the function:

42.   Write a piecewise formula for the function:
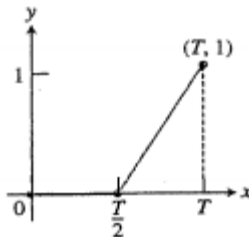

43.   Write a piecewise formula for the function:
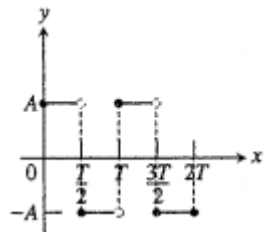

43 variation.   Write a piecewise formula for the function:

47.   Write a piecewise formula for the function:

48.   Write a piecewise formula for the function:

49.   Draw the graph of the function, re-write using a piecewise formula, then name the domain and range.
$$f(x) = -|3 - x| + 2$$

59.   What is the domain and range of $f(x) = \dfrac{x}{\sqrt{9-x^2}}$?

60. Algebraically show the range of $f(x) = 1 + \frac{1}{x-1}$

61. If $f(x) = 2x - 1$ and $g(x) = x + 3$, what is $(f \circ g)(2)$?

Section 1.3

1. Find the domain and range showing all algebra (including for the range!) $y = -2^x + 3$

4. Find the domain and range showing all algebra (including for the range!) $y = -2^{-x} - 1$

7. Re-write the following using base 2: $\left(\frac{1}{8}\right)^{2x}$

8. Re-write the following using base 3: $\left(\frac{1}{27}\right)^{x}$

9. Calculator question: Find the zeroes of the function: $f(x) = 2^x - 5$

12. Calculator question: Find the zeroes of the function: $f(x) = 3 - 2^x$

Section 1.4

For the following six problems, Graph the curve, determine the initial and terminal points (if they exist), and indicate the direction that the curve is being traced. Then find the Cartesian curve and indicate how much of the Cartesian curve was traced by the parametric curve.

6. $x = -\sqrt{t}, \ y = t, \ t \geq 0$

8. $x = sec^2 t - 1, \ y = \tan t, \ \frac{-\pi}{2} \leq t \leq \frac{\pi}{2}$

9. $x = \cos t, y = \sin t, 0 \leq t \leq \pi$

12. $x = 4\cos t, y = 2\sin t, 0 \leq t \leq 2\pi$

15. $x = 2t - 5, y = 4t - 7, -\infty < t < \infty$

21. $x = \sin t, y = \cos 2t, -\infty < t < \infty$

24. Find a parametrization for the line segment with endpoints (-1, 3) and (3, -2)

Section 1.5

23. Find the inverse of $f(x) = \frac{2x+1}{x+3}$ and verify that $(f^{-1} \circ f)(x) = x$

24. Find the inverse: $f(x) = \frac{x+3}{x-2}$ and verify that $(f^{-1} \circ f)(x) = x$

Re-write in parametrics, and then graph (you can use your calculator to graph the equation in parametric mode, then sketch to your paper), the following: f, f⁻¹, and y = x   (for questions 25 – 30)

25. $f(x) = e^x$

26. $f(x) = 3^x$

27. $f(x) = 2^{-x}$

28. $f(x) = 3^{-x}$

29. $f(x) = \ln x$

30. $f(x) = \log(x)$ (Note: We use natural logs in calc...)

34.   Back to no calculator: Solve for t

$$e^{0.05t} = 3$$

36.   Solve for x: (Note: I love this question!!!!) (No calculator!!!)
$$2^x + 2^{-x} = 5$$

37.   Solve for y: $\ln y = 2t + 4$

38.   Solve for y: $\ln(y - 1) - \ln 2 = x + \ln x$

      Note: The answer to this is $y = 2xe^x + 1$ but you need to show the work!

57.   What is the solution to the equation $2 - 3^{-x} = -1$?

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Section 1.6

Find the missing values in the following four questions:

	Angle	Radius	Arc Length
1.	$\dfrac{5\pi}{8}$	2	?
2.	175°	?	10
3.	?	14	7
4.	?	6	$\dfrac{3\pi}{2}$

5a.   Is sine even or odd?

5b.   Is cosine even or odd?

5c.   Is secant even or odd?

6.   Is tangent even or odd?

7.   Is cosecant even or odd?

8.   Is cotangent even or odd?

9. $\cos \theta = \dfrac{-15}{17}$ and $\sin \theta$ is positive. Find the other five trig functions.

10. $\tan \theta = -1$ and $\sin \theta$ is negative. Find the other five trig functions.

33. $\csc x = 2, 0 < x < 2\pi$. Solve for x.

41.   Find $\sin\left(\cos^{-1}\left(\dfrac{7}{11}\right)\right)$

42.   Find $\tan\left(\sin^{-1}\left(\dfrac{9}{13}\right)\right)$