1. Solve the following equations for x. Check your solutions.

(a). $\sqrt{x+5} - 4 = 0$ $x = 11$

(b). $(x+4)^{3/2} = 27$ $x = 5$

(c). $|2x - 1| = 3x + 6$ $x = -1$ (note: $x = -7$ is an extraneous solution.)

2. Section 1.6 #100

3. Solve the following inequalities. Then graph the solution set.

(a). $3x + 4 > 5$ $x > 1/3$ **(b).** $-2 < -2(x+3) \leq 6$ $-6 \leq x < -2$

(c). $\left|\dfrac{x-2}{3}\right| < 2$ $-4 < x < 8$ **(d).** $|x+4| \geq 3$ $x \leq -7$ or $x \geq -1$

4. Section 1.7 #85, 99

5. Solve the following inequalities. Then graph the solution set.

(a). $x^2 + 2x > 8$ $(-\infty, -4) \cup (2, \infty)$ **(b).** $\dfrac{5}{x-6} < \dfrac{3}{x+2}$ $(-\infty, -14) \cup (-2, 6)$

6. Section 1.8 #74, 78 74: (a) $t = 8$ sec (b) $0 \leq t < 1.172$ and $6.828 < t \leq 8$ 78: $90,000 \leq x \leq 100,000$; \$30.00 $\leq p \leq$ \$32.00

7. Find the slope and y-intercept of

(a). $2x + 3y = 4$ $m = -\frac{2}{3}, b = \frac{4}{3}$ **(b).** $4x - 8 = 0$ slope is undefined; no x-intercept

8. Find an equation of the line with the given properties.

(a). Passes through the point $(3, -5)$ and has slope $m = -2$. $y + 5 = -2(x-3) \Rightarrow y = -2x + 1$

(b). Passes through the points $(-2, 4)$ and $(3, -1)$. $y = -x + 2$

(c). Passes through the point $(-1, 2)$ and $(4, 2)$. $y = 2$

(d). Passes through the point $(2, 1)$ and is perpendicular to the line $4x + 3y = 2$. $y - 1 = \frac{3}{4}(x-2) \Rightarrow y = \frac{3}{4}x - \frac{1}{2}$

9. Section 2.1, #95. Hint: The value of the oven when it is discarded is \$0.

10. Determine whether the equation represents y as a function of x: $x^2 + y = -9$ Yes (you can solve for y)

11. Evaluate, if possible, the function at the specified value and simplify.

(a). $f(x) = \dfrac{4x+1}{\sqrt{x}}$ (i). $f(4) = \frac{17}{2}$ (ii). $f(x+2) = \frac{4x+9}{\sqrt{x+2}}$

(b). Section 2.2 #32 (a) 19 (b) 17 (c) 0

12. Find the domain of $f(x) = \sqrt{2x - 3}$ $x \geq \frac{3}{2}$

13. Section 2.3 #9, 14, 33 14: Function (Passes VLT)

14. Find the zeros of $f(x) = \dfrac{x^2 - 4}{x}$ algebraically. $x = -2, 2$

15. Determine whether $f(x) = x^3 + 3$ is odd, even, or neither. You must show work. Neither

16. Section 2.4 #39

17. Section 2.5 #9(c,d,g), 13, 27

18. If $f(x) = 2x^2 - 3$ and $g(x) = x + 2$, find

(a). $(f - g)(-1) = -2$ **(b).** $(fg)(2t) = 16\,t^3 + 16\,t^2 - 6\,t - 6$

19. Given $f(x) = \frac{1}{x}$ and $g(x) = 6 - 2x$,

(a). Find $f \circ g$ and state the domain. $(f \circ g)(x) = \dfrac{1}{6 - 2x}$; All real, except $x = 3$.

(b). Find $f \circ f$ and state the domain. $(f \circ f)(x) = x$; All real, except $x = 0$.

20. Section 2.6 #45

21. Section 2.7 #20 It should look like the graph of $y = \sqrt[3]{x}$

22. Verify that the following functions are inverses of each other $f(x) = \dfrac{1}{2 + x}$ and $g(x) = \dfrac{1 - 2x}{x}$. Verify $f(g(x)) = x$ and $g(f(x)) = x$.

23. Given $f(x) = (x-4)^2, x \geq 4$, determine whether it has an inverse function. If it does, find the inverse function. Also, state the domain and range of both f and f^{-1}.
Yes, it passes the VLT; $f^{-1}(x) = \sqrt{x} + 4$; domain of f: $x \geq 4$; range of f: $y \geq 0$; domain of f^{-1}: $x \geq 0$; range of f^{-1}: $y \geq 4$.

24. Section 3.1 #15(c), 28, 45, 80 28: $f(x) = \left(x - \frac{3}{2}\right)^2 - 2$; Vert. $\left(\frac{3}{2}, -2\right)$; Axis: $x = \frac{3}{2}$ 80: \$408; \$468; \$ 432

25. Given $f(x) = \dfrac{1}{4}x^2 - 2x - 12$, find the vertex and x-intercepts algebraically. Vertex: $(4, -16)$; Int: $x = -4, 12$