*This review is a resource that you are to use to help you prepare for the unit assessment. It is not comprehensive. Review all materials from the unit and evaluate your own level of mastery for each skill set area. Use all resources available to you, as needed, to best prepare for the unit assessment.*

Skill Set A: Identify each function family by its equation and the shape of its graph

1-10: For each function family, state the parent function and sketch its graph.

1. Identity Function

Equation: $f(x) = x$
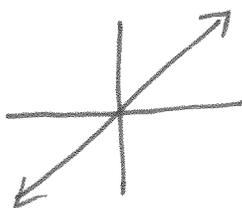
2. Absolute Value Function

Equation: $f(x) = |x|$

3. Square Function

Equation: $f(x) = x^2$
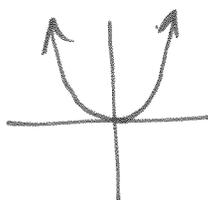
4. Cubic Function

Equation: $f(x) = x^3$
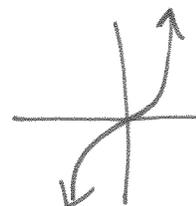
5. Reciprocal (Value) Function — oopsy!
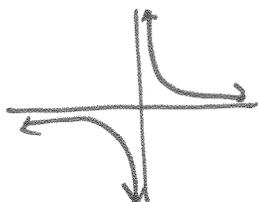
Equation: $f(x) = \frac{1}{x}$

6. Square Root Function

Equation: $f(x) = \sqrt{x}$
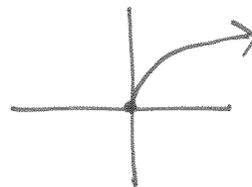
7. Greatest Integer Function

Equation: $f(x) = [x]$
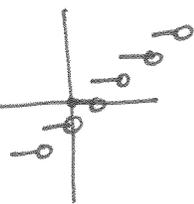
8. Logarithmic Function

Equation: $f(x) = \log x$
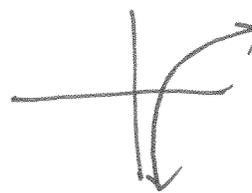
9. Exponential Function

Equation: $f(x) = 2^x$
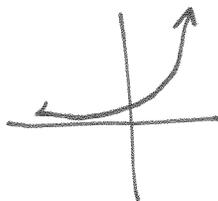
10. Sine Function

Equation: $f(x) = \sin x$
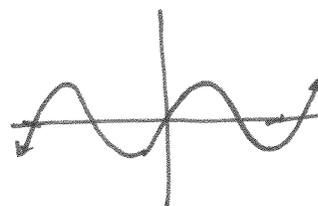
Skill Set B: Algebra I Prerequisite Skills: Solve linear equations and inequalities; graph linear functions and inequalities

11-12: Solve each equation for the indicated variable. Circle your final solution.

11. Solve for h: $A = \frac{1}{2}(b \cdot h)$

$2A = b \cdot h$

$$\boxed{h = \frac{2A}{b}}$$

12. Solve for L: $P = 2L + 2W$

$$\frac{P - 2W}{2} = \frac{2L}{2}$$

$$\boxed{\frac{P}{2} - W = L \text{ or } \frac{P - 2W}{2}}$$

13-18: Solve each equation or inequality. Show your work and circle your final solution.
Graph the solution set for each inequality on a number line.

13. $5x < 9 + 2x$ or $9 - 2x > 11$

$\underline{-2x \quad -2x} \qquad \underline{-9 \quad -9}$

$\dfrac{3x}{3} < \dfrac{9}{3} \qquad \dfrac{-2x}{-2} > \dfrac{2}{-2}$

$x < 3 \qquad\qquad x < -1$

[number line with open circles at -1 and 3]

$\boxed{x < 3}$

14. $\left(\dfrac{1}{5}x + \dfrac{3}{10} = \dfrac{2}{30}x - 5\right)30$

$6x + 9 = 2x - 150$

$\underline{-2x \qquad -2x}$

$4x + 9 = -150 \qquad \dfrac{4x}{4} = \dfrac{-159}{4}$

$\underline{\quad -9 \quad -9}$

$4x = -159$

$\boxed{x = -39.75}$

15. $-8 \le 3x - 20 \le 52$

$\underline{+20 \qquad +20 \quad +20}$

$\dfrac{12}{3} \le \dfrac{3x}{3} \le \dfrac{72}{3}$ [number line with closed circles at 4 and 24]

$\boxed{4 \le x \le 24}$

16. $1 + 5(x - 8) \le 2 - (x - 5)$

$1 + 5x - 40 \le 2 - x + 5$

$5x - 39 \le -x + 7$

$\underline{+x \qquad\quad +x}$

$6x - 39 \le 7 \qquad x \le \dfrac{23}{3}$

$\underline{+39 \quad +39}$

$6x \le 46$ [number line] $\dfrac{23}{3}$

17. $0.75(8x + 20) = 3 + 2(x - 1)$

$6x + 15 = 3 + 2x - 2$

$6x + 15 = 2x + 1$

$4x + 15 = 1$

$4x = -14$

$\boxed{x = -3.50 \text{ or } \dfrac{-7}{2}}$

18. $-3(4w - 1) > 18$

$-12w + 3 > 18$

$-12w > 15$

$w < \dfrac{-15}{12}$ [number line with open circle at -1.25]

$\boxed{w < -1.25 \text{ or } \dfrac{-5}{4}}$

19-24: Graph each function or inequality.

19. $f(x) = -\dfrac{2}{3}x + 1$

20. $f(x) = -\dfrac{2}{3}(x + 1) - 2$

21. $y \le -5(x - 5) + 8$

22. $y > \dfrac{4}{3}x - 5$

23. $y = -2(x + 3) + 8$

24. $3x - y > 4$

$-y > -3x + 4$

$y < 3x - 4$
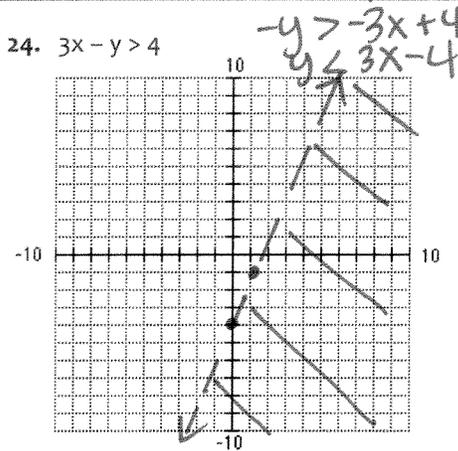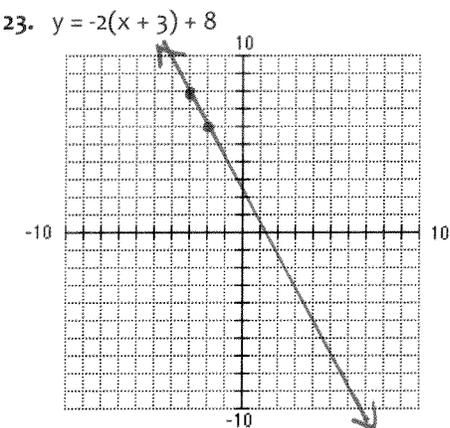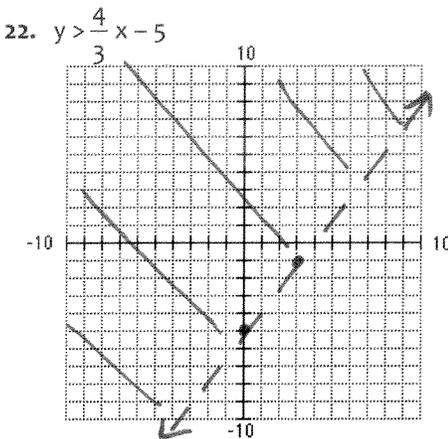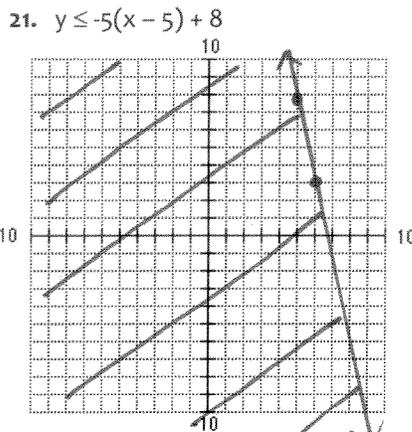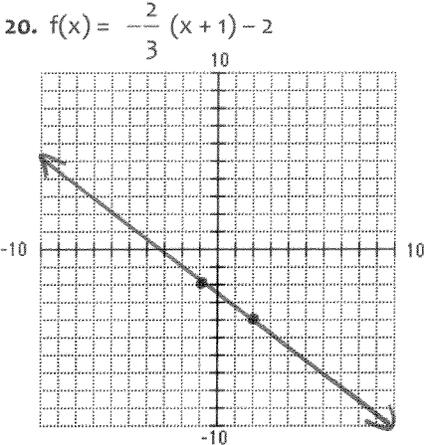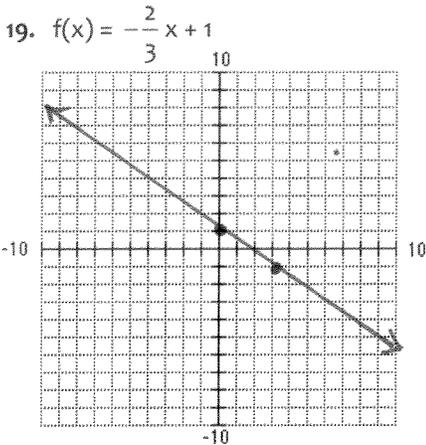
Skill Set C: Solve absolute value equations and inequalities

25-26: Evaluate each expression if a = -3, b = 7, and c = -2. Show your work and circle your final solution.

25. $3|a - b| + c$

$3|-3 - 7| + -2$

$3|-10| + -2$

$3(10) - 2$

$30 - 2 = \boxed{28}$

26. $a|b - 7| - c|a|$

$-3|7 - 7| - -2|-3|$

$-3|0| + 2(3)$

$0 + 6 = \boxed{6}$

27-38: Solve each absolute value equation or inequality. State the solution using set builder notation.

27. $|t - 3| - 8 = 0$

$|t-3| = 8$

$t-3 = 8 \quad t-3 = -8$

$t = 11 \quad t = -5$

$\boxed{\{-5, 11\}}$

28. $|3x + 2| \leq 7$

AND

$3x+2 \leq 7 \qquad 3x + 2 \geq -7$

$3x \leq 5 \qquad\quad 3x \geq -9$

$x \leq \frac{5}{3} \qquad\quad x \geq -3$

$\boxed{-3 \leq x \leq \frac{5}{3}}$

29. $|7 + 3a| = 11 - a$

$7+3a = 11-a \qquad 7+3a = -11+a$

$7+4a = 11 \qquad\quad 7+2a = -11$

$4a = 4 \qquad\qquad 2a = -18$

$a = 1 \qquad\qquad\quad a = -9$

$\boxed{\{-9, 1\}}$

30. $|x + 2| \leq 2x + 7$

AND

$x+2 \leq 2x+7 \qquad x+2 \geq -2x-7$

$2 \leq x+7 \qquad\qquad 3x+2 \geq -7$

$-5 \leq x \qquad\qquad\quad 3x \geq -9$

$x \geq -5 \qquad\qquad\qquad x \geq -3$

FA: $\boxed{x \geq -3}$

31. $-2|7x| > 56$

$|7x| < -28$

$+\# \not< -\#$

$\boxed{\varnothing}$

32. $|x + 8| - 3 = -3$

$|x+8| = 0$

$x+8 = 0$

$x = -8$

$\boxed{\{-8\}}$

33. $-6|2x - 14| = 42$

$|2x-14| = -7$

$\boxed{\varnothing}$

34. $|x + 8| > 3$

$x+8 > 3 \quad\text{or}\quad x+8 < -3$

$x > -5 \qquad\qquad\quad x < -11$

$\boxed{x < -11 \text{ or } x > -5}$

35. $4|2x| \geq -64$

$|2x| \geq -16$

$\boxed{\mathbb{R}}$

36. $3|x - 5| - 7 = 2$

$3|x-5| = 9$

$|x-5| = 3$

$x-5 = 3 \qquad x-5 = -3$

$x = 8 \qquad\quad x = 2$

$\boxed{\{2, 8\}}$

37. $-2|7 - 3y| - 6 = -14$

$-2|7-3y| = -8$

$|7-3y| = 4$

$7-3y = 4 \qquad 7-3y = -4$

$-3y = -3 \qquad -3y = -11$

$y = 1 \qquad\quad y = \frac{11}{3}$

$\boxed{\{1, \frac{11}{3}\}}$

38. $2|4 - 3x| = 10x + 24$

$|4-3x| = 5x+12$

$4-3x = 5x+12 \qquad 4-3x = -5x-12$

$4 = 8x+12 \qquad\qquad 4+2x = -12$

$-8 = 8x \qquad\qquad\quad 2x = -16$

$-1 = x \qquad\qquad\qquad x = -8 \text{ extr.}$

$\boxed{\{-1\}}$

Skill Set D: Graph absolute value functions and inequalities

*39-44: Graph each absolute value function or inequality.*

**39.** $f(x) = -2|x - 3| + 5$ V(3,5)
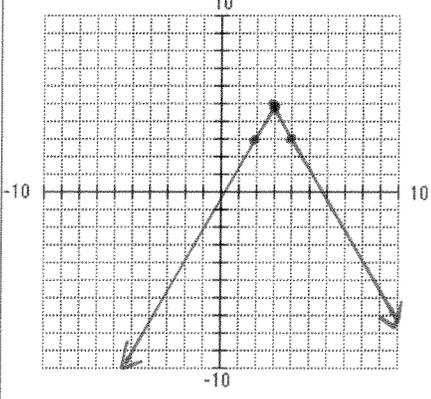
40. $y > 2|x + 5|$ V(-5,0)
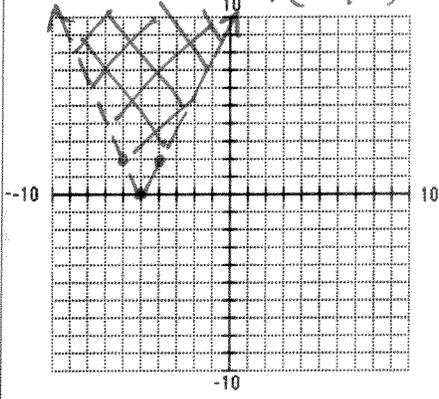
41. $y = \frac{2}{3}|x + 5| - 4$ V(-5,-4)
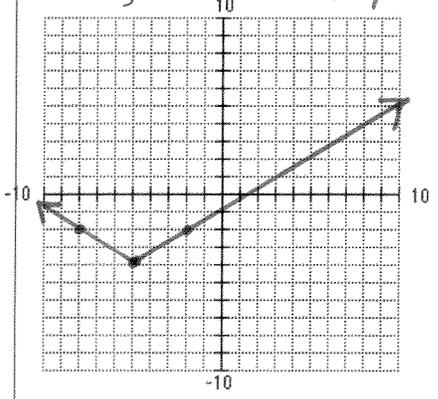
42. $y \le -\frac{2}{3}|x - 4| + 3$ V(4,3)
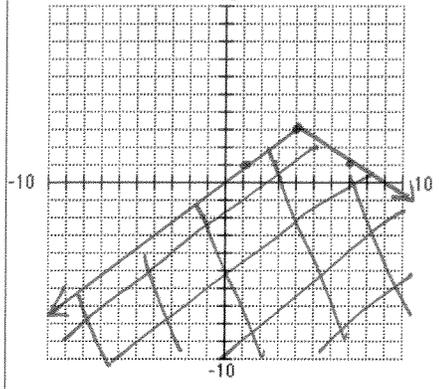
43. $y + 3|x| < 8$ $y < -3|x| + 8$ (0,8)V
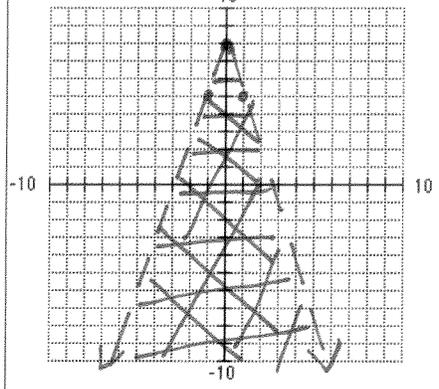
44. $f(x) = -\frac{1}{4}|x|$ V(0,0)
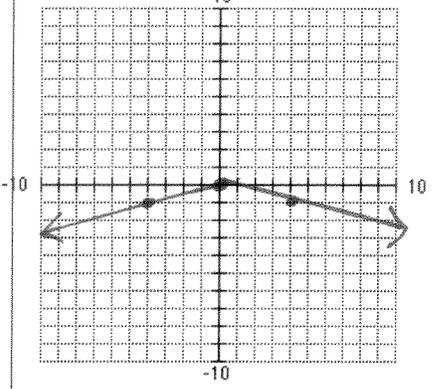
Skill Set E: Describe the transformation of the graph of a linear or absolute value function as compared to the graph of the parent function

45-48: Given the parent functions $f(x) = x$ and $f(x) = |x|$, completely describe the transformation of the graph of the function as compared to the parent graph.

45. $f(x) = 2|x| - 5$

Shifts down 5
Stretches vertically by a factor of 2
(more narrow)

46. $f(x) = 4(x + 6) - 2$

Shifts left 6 and down 2
Stretches vertically by a factor of 4 (more narrow)

47. $f(x) = -3|x - 2| + 3$

Shifts right 2 and up 3
Reflects downward
Stretched vertically by a factor of 3
(more narrow)

48. $f(x) = \frac{1}{2}|x| - 7$

Shifts down 7
Compresses vertically by a factor of $\frac{1}{2}$ (wider)