Name _____ Date _____

Advanced Algebra/Trig Honors Review Packet

Solve each equation for the variable.

1. $\frac{1}{2}x + 7 = \frac{3}{4}x - 4$ _____

2. $16x - 3(4x + 7) = 6x - (2x + 21)$ _____

3. $3(x - 3) - 7(x + 3) = 4(2x - 3) - 8(2x + 3)$ _____

4. $2|2x + 3| = 12$ _____

5. $4x - (x + 6) = 3x - 4$ _____

6. $9(2 - x) + 3(5 + 2x) = 2(7 - 2x) - 4(x - 1)$ _____

7. Solve for F: $C = \frac{5}{9}(F - 32)$ _____

8. Solve for P: $A = P + Prt$ _____

9. Solve for v: $t = \frac{u+v}{v}$ _____

10. Solve for h: $S = 2lw + 2lh + 2wh$ _____

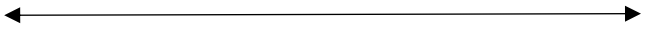
11. The area of a rectangle measuring 11 centimeters wide is 176 square centimeters. What is the length of the rectangle? _____

12. A square has a perimeter of 40 centimeters. What is its area? _____

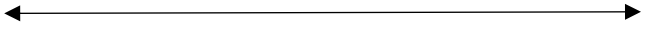
13. The diameter of a circle is 14 inches. What is the circumference and the area of the circle? C = _____ A = _____

Solve each of the following inequalities and graph the solution on the number line.

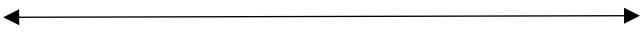
14. $-5x \geq 2x - 6$



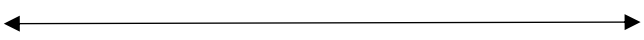
15. $-10 < -2x - 2 \leq -4$



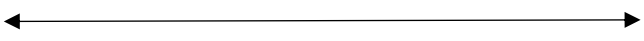
16. $x + 7 \geq 4$ or $x - 2 < 2$



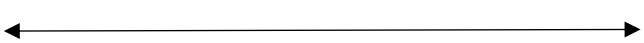
17. $|x - 12| < 6$



18. $|x + 4| \geq 2$



19. $-3|x - 10| > 9$



20. Given the sets of ordered pairs, find each of the following:

I. $(3, 9)$ and $(1, 5)$

II. $(-9, -5)$ and $(3, -2)$

a. Find the slope.
b. Find the distance of the segment joining the two points.
c. Find the midpoint of the segment.
d. Write the equation of the line in slope-intercept form.
e. Write the equation of the line in point-slope form perpendicular to the line in part d. passing through the point $(-1, 5)$.

Simplify each of the following:

21. $\sqrt{20} + \sqrt{45} - \sqrt{5}$ _____

22. $(4\sqrt{5})(3\sqrt{10})$ _____

23. $(7 - \sqrt{2})(8 + \sqrt{2})$ _____

24. $(-5 - \sqrt{3})^2$ _____

25. $\frac{2}{5\sqrt{3}}$ _____

26. $\frac{4-\sqrt{2}}{1+\sqrt{2}}$ _____

Solve the following using the zero product property:

27. $x^2 - 6x - 7 = 0$ _____

28. $4x^2 - 64 = 0$ _____

29. $2x^3 - 12x^2 + 18x = 0$ _____

30. $4x^2 + x = 5$ _____

Solve each of the following using the quadratic formula:

31. $2x^2 - 6x + 4 = 0$ _____

32. $4x^2 + 4x = 9$ _____

33. Graph each of the following. Be sure to label the vertex, the *x*-intercepts, and the *y*-intercept. Then state the domain and range of each function.

a. $y = x^2 + 3x - 10$ b. $y = -x^2 + 4x$

34. Graph the following absolute value functions. For each, state the domain and range.

a. $y = -|x + 1| - 2$ b. $y = 2|x - 1| - 4$

35. Solve the systems of equations below using BOTH the elimination and the substitution methods.

a. $\begin{cases} 3x + y = 13 \\ 2x - y = 2 \end{cases}$

b. $\begin{cases} y = -3x \\ x = 6y + 38 \end{cases}$

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36. Graph and classify each of the following systems.

a. $\begin{cases} 2x + 3y = 12 \\ 18 - 6y = 4x \end{cases}$

b. $\begin{cases} 4x - 3y = 12 \\ 12x + 9y = -36 \end{cases}$

Using the special right triangles, find each of the following:

37. Find the remaining sides of a $30° - 60° - 90°$ triangle if the short leg is 3 cm.

38. Find the length of the legs of a $45° - 45° - 90°$ triangle if the hypotenuse is $5\sqrt{2}$.

39. Find the remaining sides of a $30° - 60° - 90°$ triangle if the short leg is $4\sqrt{2}$.

40. Find the remaining sides of a $30° - 60° - 90°$ triangle if the hypotenuse is $12\sqrt{3}$.

41. Find the remaining sides of a $30° - 60° - 90°$ triangle if the long leg is 7 cm.

42. Find the length of the hypotenuse of a $45° - 45° - 90°$ triangle if the legs are $3\sqrt{6}$.

43. An escalator lifts people to the second floor of a building, which is 25 feet above the first floor. The escalator rises at a $30°$ angle. To the nearest foot, how far does a person travel from the bottom to the top of the escalator?

44. A ladder is leaning against a wall. The top of the ladder is 4 feet above the ground and the bottom of the ladder makes a $60°$ angle with the ground. How long is the ladder and how far from the wall is the bottom of the ladder?

45. In a garden, a bird bath 2 feet, 6 inches tall casts an 18 inch shadow at the same time an oak tree casts a 90 foot shadow. How tall is the oak tree?