

Algebra 1 Honors Semester 2 Final Exam Review

Name _____

1. x is a number such that $0 > x > -1$. What is the order from least to greatest of these expressions?

$$x, x^0, x^3, x^{-3}, 0$$

2. Simplify this expression.

$$(2x^4y^5)^{-2}(x^5y^2z^6)^4(3y^7z^{-3})^2$$

3. The area of a square is $32x^6y^5 \text{ cm}^2$. What is the length of one side of the square in simplest form?

4. When she was nine, Toni's parents gave her \$0.50 a week to spend. Every year after that, they doubled the amount they gave her. How much money did Toni get each week when she was 19?

5. Butch has a collection of baseball cards worth \$250. He has been told the collection will increase in value 7% every five years. How much will it be worth in 30 years, rounded to the nearest dollar?

6. In a geometric sequence, $a_4 = 81$, $a_5 = 27$, and $a_6 = 9$. What is a_{11} ?

7. In a geometric sequence, $a_4 = -1$, $a_5 = 5$, and $a_6 = -25$. What is the explicit formula for this sequence?

8. The side length of a square tile is assigned as shown (in inches).

If each side of the tile is increased by seven inches, write an expression that represents the area of the larger tile (in square inches).



9. The area of a square is given by the polynomial $16x^2 + 24x + 9$. Write an expression that represents one side length of the square.

10. The area of a rectangle is given by the expression $2x^2 + 15x + 28$. If the length of the rectangle is $(x + 4)$, write an expression that represents its width.

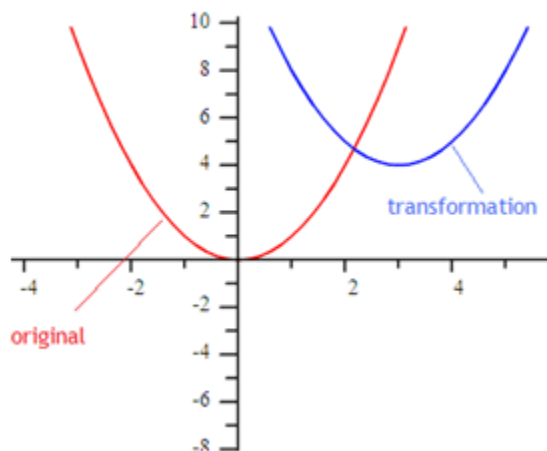
11. What is the completely factored form of the expression $6xy^2 + 33xy + 45x$?

12. Write an expression that is equivalent to the product $(5x - 3)(5x + 3)$ in simplified form.

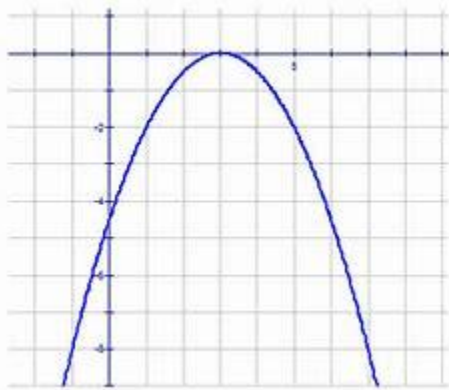
13. What is the fully simplified form of the expression $\frac{y^2 - 2y - 8}{2y + 4}$?

14. What is $\frac{7m^3}{n}$ divided by $\frac{m^5n^4}{14m^3}$ in simplified form?

15. The graph of the parent function $f(x) = x^2$, and the graph of the $g(x)$, a transformation of $f(x)$ are shown. What is the equation of $g(x)$?



16. The graph of a transformation of the parent function is shown.
What is the function?



17. What are the coordinates of the x -intercept(s) of the graph of $y = x^2 - 2x - 15$?
18. A quadratic function passes through the points $(-11, 3)$ and $(-1, 3)$. What is the equation of the axis of symmetry?
19. Find the minimum value(s) of the function. $y = x^2 + 6x - 15$
20. Solve the equation. $3x^2 + 7x + 7 = 2x^2 - x - 21$
21. During a Field Day contest, Henry throws a water balloon straight up into the air. A tracking device measures the balloon's height, in feet. The table shows some of the data.

t	$h(t)$
0	5
1	33
2	45
3	41

Use a graphing calculator to find the equation for $h(t)$. How high does the water balloon go, rounded to the nearest whole number?

22. The number of people joining a fantasy sport league can be modeled by the equation $y = 0.25(4.98)^x$, where y represents the number of participants and x is the number of weeks since the first week of the season. What trend in total participants over time does this equation indicate?
- The overall number of people participating in the fantasy league remains approximately constant.
 - Each week the number of people participating in the fantasy league decreases by approximately one fourth.
 - Participation in the fantasy league increases at an approximate rate of five per week.
 - The number of people participating in the fantasy league approximately quintuples each week.
23. After being featured on the news, the membership of the Hip-Hop Dance Club has quadrupled at each meeting. Initially, there are 2 members. What function, $H(t)$, can be used to describe the increase in membership as a function of time, t , in weeks?

24. What points are solutions to the system of equations, rounded to the nearest integer?

$$y = x^2 + 30 \text{ and } y = 3x + 40$$

25. The best-fit line for a data set is $y = 11x + 42$, where y is the end of semester exam score and x is the number of hours spent studying. What does the slope of the best-fit line represent?
- For every additional hour studied, the predicted end-of-semester exam score increases by 42 points.
 - For every additional point earned on the test, 11 additional hours are spent studying.
 - For each additional hour studied, the predicted end-of-semester exam score decreases by 11 points.
 - For each additional hour studied, the predicted end-of-semester exam score increases by 11 points.

26. List the correlation coefficient for the data represented by each type of scatter plot.

points on a straight line that is increasing: _____

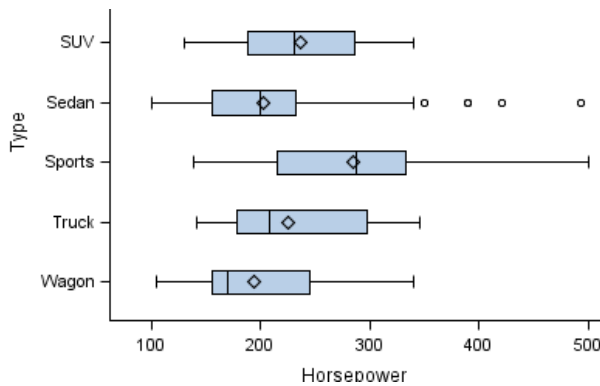
points on a straight line that is decreasing: _____

points that are scattered all around the graph: _____

27. Parker records the amount of time he spends playing video games each night. He records the following times (in hours): 3.25, 2.50, 3.50, 2.00. On the fifth day, the amount of time spent playing increases the mean absolute deviation and standard deviation. Which is a possible time, in hours, for the amount of time spent playing video games on the fifth night?

- A. 2.976 B. 4.125 C. 3.413 D. 2.408

28. The box plot below shows five different types of vehicles and the amount of horsepower they each have.



Which type of car has the lowest average horsepower?

29. Which residual plot shows data that should be described as linear?

