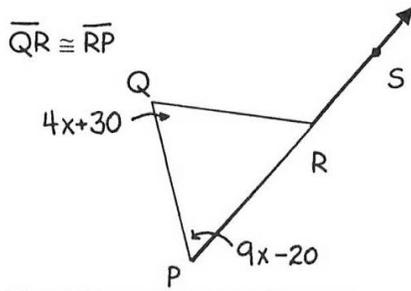


Cumulative Review after Unit 5 Test Show all work! Use separate paper, if needed.

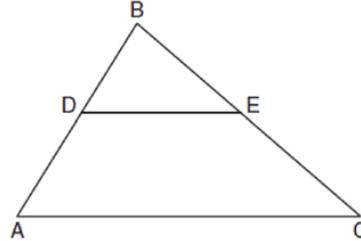
1. Solve by factoring $6x^2 + 1 = 5x$

2. Solve $2 \cdot 13^{5-x} + 4 = 47$

3. Given the information below, find $m\angle SRQ$.



4. In the diagram below of $\triangle ABC$, segment DE is a midsegment of triangle ABC , $DE = 14$, $AB = 20$, and $BC = 26$. Find the perimeter of $\triangle ABC$.



5. A group of students need to rent a large room for a school dance. The cost per ticket to the dance is inversely proportional to the number of students who buy a ticket. Suppose the venue for the dance charges \$2400 for the evening room rental.

- Write a model for the cost per ticket t in terms of the number of students x who buy a ticket.
- If we project that 200 students will buy a ticket, how much do we need to charge per ticket to break even?
- If we set the cost per ticket to \$25, how many students need to buy a ticket to break even?

6. The data below displays men's Olympic springboard diving records. Let x represent years after 1980.

Year	1980	1984	1988	1992	1996	2000
Points	905.02	754.41	730.8	676.53	701.46	708.72

- Find a quadratic best fit model for the data.
- Estimate the diving record in 2004.
- In what year(s) could we expect the diving record to be 775 points.

7. Given the following

$$\sqrt[4]{\frac{243k^7y^{13}}{k^3y^6}}$$

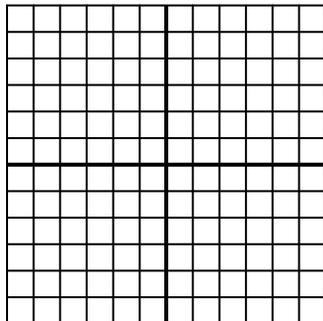
- Simplify the expression

- Write the expression in exponential form

8. Solve. Give exact answer(s).

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

10. Given the coordinates of ABC are A (-1, 1), B (0, 3), and C (-3, 1). The coordinates of A'B'C' are A' (1, 1), B' (3, 0), C' (1, 3).



- a. Graph the preimage and image.
 b. Specific Description : _____
 c. Algebraic Rule: _____

12. A car purchased new for \$28,500 depreciates at a rate of 12% per year.

- a. Write a next-now formula to model this situation
 b. Write an equation of the form $y = a(b)^x$ to model this situation
 c. Predict the value of the car 5 years later.

14. Given the following data on potato diameter and the time in minutes to boil a potato, find a power model of the time to boil a potato versus the diameter of the potato. Then use the model to determine the amount of time required to boil a potato with a diameter of 32 mm.

Diameter (mm)	20	25	30	35	40	45	50
Time (t)	27	42	61	83	109	138	170

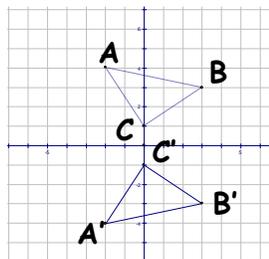
Model: _____

Time: _____

15. One of your neighbors wants to fence in part of his back yard for his dog up against one side of his house. He has bought 120 feet of fencing. He wants to maximize the area for his dog, but is not sure what dimensions to make the fence. He knows you are taking an honors math course, so you can help him! ☺

- a. Write a quadratic function in factored form to represent the area A of his dog's lot.
 b. Write a quadratic simplified form to represent the area of his dog's lot.
 c. Find the maximum volume of the box.

11. Given the following transformation,



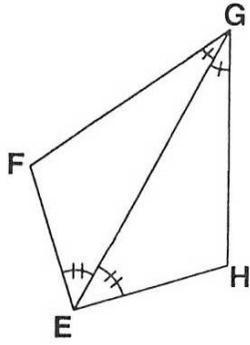
- a. Specifically describe the transformation shown.

 b. Write its Algebraic Rule: _____
 c. If A'B'C' is moved up 4 and 3 to the right and is labeled $\Delta A''B''C''$, write the algebraic rule for the transformation of $\Delta A'B'C'$ to $\Delta A''B''C''$.

13. Write an exponential function in the form $y = a(b)^x$ for a graph passing through (2, 18) and (5, 60.75)

16. For each pair of triangles, identify if they would be proved congruent by SSS, SAS, or ASA postulate. Then write the triangle congruence statement.

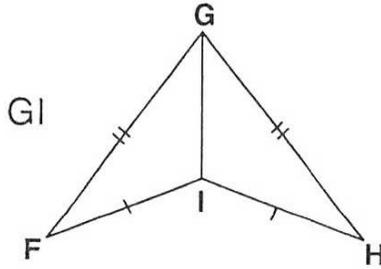
a.



$\triangle GFE \cong \triangle$ _____

by _____

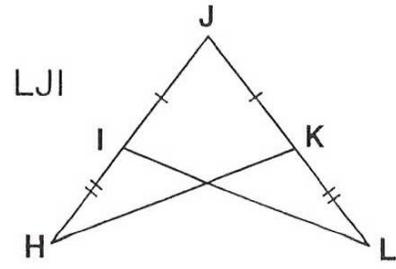
b.



$\triangle GFI \cong \triangle$ _____

by _____

c.



$\triangle JKH \cong \triangle$ _____

by _____

17. The Big Brick Bakery company sells more bagels when it reduces its prices, but then its profits change. The function $y = -1000(x + 0.55)^2 + 300$ models the bakery's daily profit in dollars from selling its bagels, where x is the price of a bagel in dollars. The bakery wants to maximize the profits.

- What is the theoretical domain of the function? Explain.
- What is the practical domain of the function? Explain.
- What is the daily profit of selling bagels at 40 cents each?
- What price should the bakery charge to maximize its profits?
- What is the maximum profit?

18. Solve

$$\frac{10}{2y+8} - \frac{7y+8}{y^2-16} = \frac{-8}{2y-8}$$

19. Solve

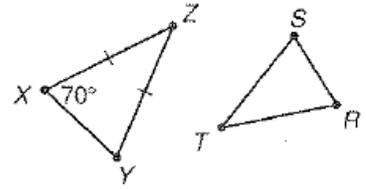
$$\left\lfloor \frac{2}{3}x - 4 \right\rfloor = 8$$

20. Evaluate $\log_2 8$

21. Let $f(x) = 3x^2 + 5x - 8$ and $g(x) = x + 4$. Perform the following operations

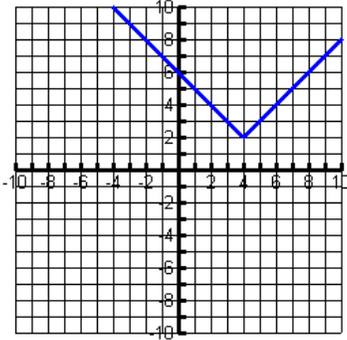
- | | |
|-------------------|----------------|
| a. $f(x) + g(x)$ | c. $f^{-1}(x)$ |
| b. $f(x) - 2g(x)$ | d. $f(x + 5)$ |

22. Given $\triangle XYZ \sim \triangle RST$. Find $m\angle R$, $m\angle S$, and $m\angle T$. Given $XZ = 15$, $ST = 6$, and $XY = 9$, find SR and TR .



$m\angle R = \underline{\hspace{2cm}}$ $m\angle S = \underline{\hspace{2cm}}$ $m\angle T = \underline{\hspace{2cm}}$
 $SR = \underline{\hspace{2cm}}$ $TR = \underline{\hspace{2cm}}$

23. Given the following function,



- Write the equation of the function

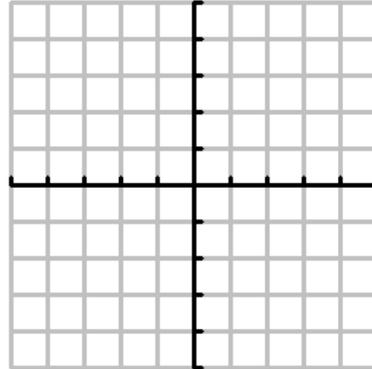
- Identify its vertex _____
- Identify its domain

- Identify its range

- How is this function translated from its parent graph? _____

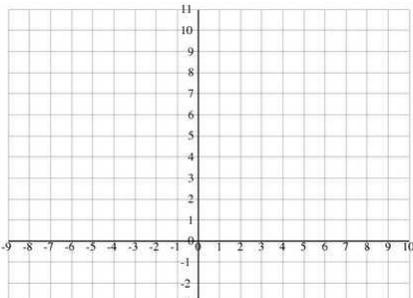
24. Graph the following piecewise function. Then determine the following

$$g(x) = \begin{cases} x + 4 & \text{if } x \geq -1 \\ 2x + 1 & \text{if } x < -1 \end{cases}$$



- $f(2) = \underline{\hspace{2cm}}$
- $f(-3) = \underline{\hspace{2cm}}$
- $f(-1) = \underline{\hspace{2cm}}$
- Domain of $g(x)$ _____
- Range of $g(x)$ _____

25. Given $f(x) = x^2 + 7x + 10$.



- Graph the function with at least 5 points.
- Vertex: _____
- Zero(s) : _____
- x-intercept(s) : _____
- axis of symmetry: _____
- direction of opening: _____

26. Given $y = \frac{5}{x+2}$

- Find its inverse.
- Determine its domain
- Determine its range.
- How is it translated from the parent $y = \frac{5}{x}$?