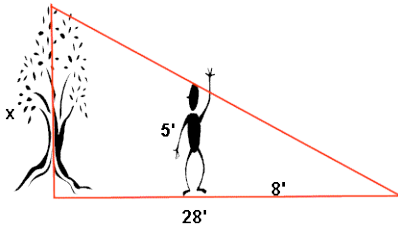
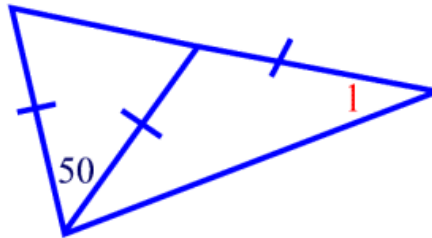


1. At a certain time of the day, the shadow of a 5' boy is 8' long. The shadow of a tree at this same time is 28' long. How tall is the tree?



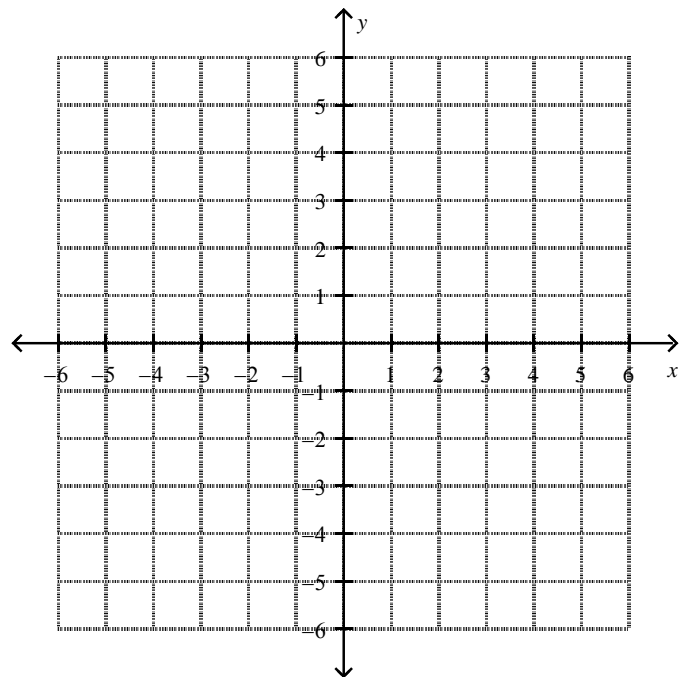
2. Find x and y if $\triangle ABC \sim \triangle PQR$,
 $m\angle R = 10x + 140$, $m\angle C = 48x - 50$,
 $m\angle P = 8y - 9$, $m\angle A = x + y$.
3. Given that H is between J and K , $JK = 71$,
 $JH = 7x - 13$, and $HK = 4x + 7$, find the
 value of x , the length of JH , and the
 length of HK .

4. Find the measure of Angle 1 in the figure below.



5. The vertices of a triangle are $D(-2, 3)$, $E(-2, -4)$
 and $F(5, -4)$. Graph and label the image with a
 reflection over the line $y = -x$. Name the image
 vertices below.

D' _____ E' _____ F' _____



Write the algebraic rule for a reflection over $y = -x$.

6. Sketch the graph of the function on a separate piece of paper. $y = x^2 + 15x + 54$
- Find the x -intercepts.
 - Find the axis of symmetry.
 - Find the vertex.
 - Find the y -intercept.
 - Is the vertex a max or a min?
7. Find the equation of a function with intercepts at $(-5, 0)$ and $(9, 0)$ and a vertex at $(1, 10)$

Find the discriminant and tell the number/type of solutions.

8. $16b^2 - 40b + 25 = 0$

9. $x^2 - 4x + 24 = 0$

10. $6k^2 + 5k - 6 = 0$

11. Solve: $6 - \sqrt[3]{1 - 7u} = 2$

12. Solve the equation $25^{2x+1} = 144$

13. In 2005, a baseball card bought for \$50 increased at a rate of 3.4% per year.

a. Write an exponential function that models the value of the baseball card.

b. Write a recursive (NOW-NEXT) function to model the data.

c. Find the value of the baseball card in 2013.

d. In what year will the baseball card be worth \$120?

14. A car's original value when purchased was \$18,000. Five years later, it was worth \$7,500.

Find an exponential equation to model the information. Then, find the value of the car ten years after the purchase.

15. Find the inverse of

a. $f(x) = \sqrt{x-6}$.

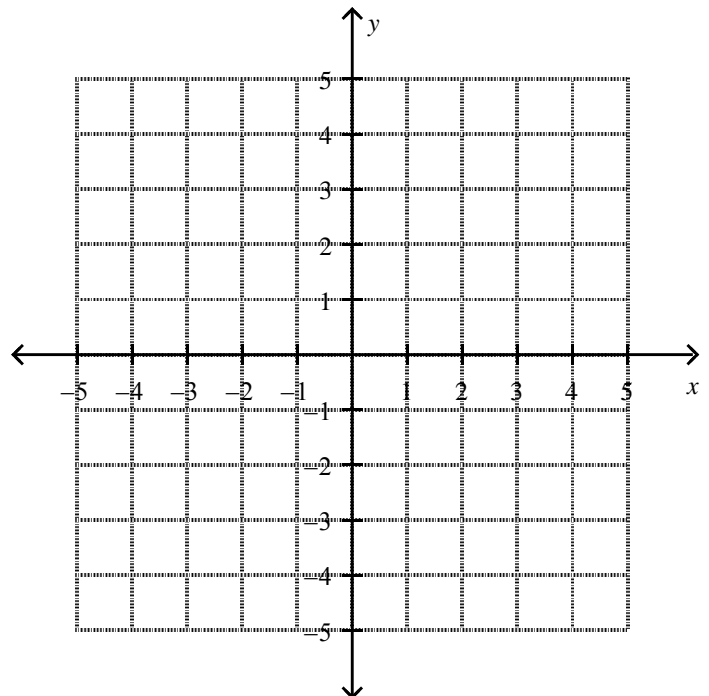
b. $y = 4x + 7$.

16. Graph and label the points J(-3, 4), K(-2, 2), L(1, 1) and M(4, 2) and then rotate the figure 270°. Graph and label the image points, and write their coordinates below. Then, write the algebraic rule for the transformation.

J' _____ K' _____

L' _____ M' _____

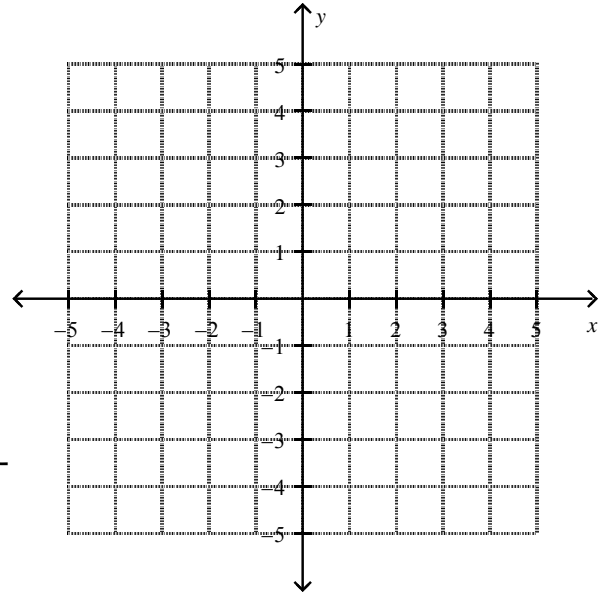
Write the algebraic rule for the rotation 270°:



17. Graph $\triangle ABC$ with $A(4, -3)$, $B(5, 1)$, and $C(2, 2)$, then graph the image of $\triangle ABC$ after the translation $(x, y) \rightarrow (x - 3, y + 2)$, then a reflection over the x -axis.

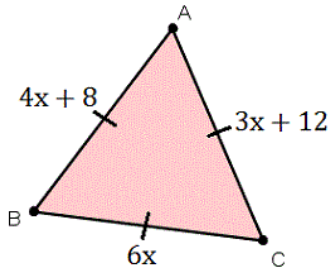
Label all your points then, write the coordinates of the final image below.

Image _____

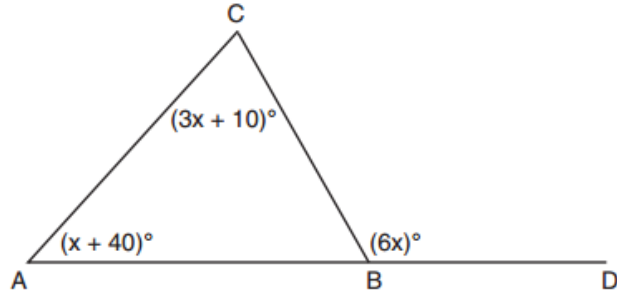


18. $\triangle SAM \cong \triangle LET$. If $SA = x^2 - 4x$, $LE = 5x - 18$ and $ET = 24$. Find SA .

19. Find the value of x .



20. Find the value of x .



21. Describe how the parabola $y = -(x - 5)^2 + 6$ is shifted from $y = x^2$.

Factor and find the solutions.

22. $2v^2 + 5v + 2 = 0$

23. $5a^2 - 18a + 9 = 0$

Factor and find the solutions.

24. $4b^2 - 35b + 49 = 0$

25. The following function models how much money, v , a certain company makes after a certain amount of time, t . At what time did they make the least amount of money?

$$v(t) = 5000 + 360t - 12t^2$$

26. Iodine-131 is used to find leaks in water pipes. It has a half life of 8.14 days.

a. Write an exponential function for a 200 mg sample.

b. Find the amount of iodine-131 remaining after 72 days.

27. On a separate sheet of graph paper, graph and compare $f(x) = 3^x$ and $g(x) = 3^{x+2} - 7$. Label each graph. Determine the domain, range, and asymptote of $g(x)$.

28. The value, V , of a car can be modeled by the function $V(t) = 15,000(0.78)^t$, where t is the number of years since the car was purchased. To the nearest tenth of a percent, what is the monthly rate of depreciation?

29. Solve $\sqrt{2x+4} = 3 + \sqrt{x-5}$

30. Simplify

$$\left(\frac{16x^{\frac{1}{4}}y^{-12}}{x^{\frac{-1}{4}}y^6} \right)^{\frac{4}{3}}$$