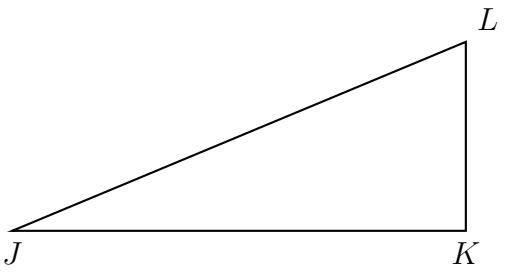
Do Now: Distance on the coordinate plane

1. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, $JL = 13$, and $JK = 12$.

   (a) Find the length KL.



   Based on the triangle above, express each trigonometric value as a fraction.

   (b) $\sin J =$

   (c) $\cos J =$

   (d) $\tan J =$

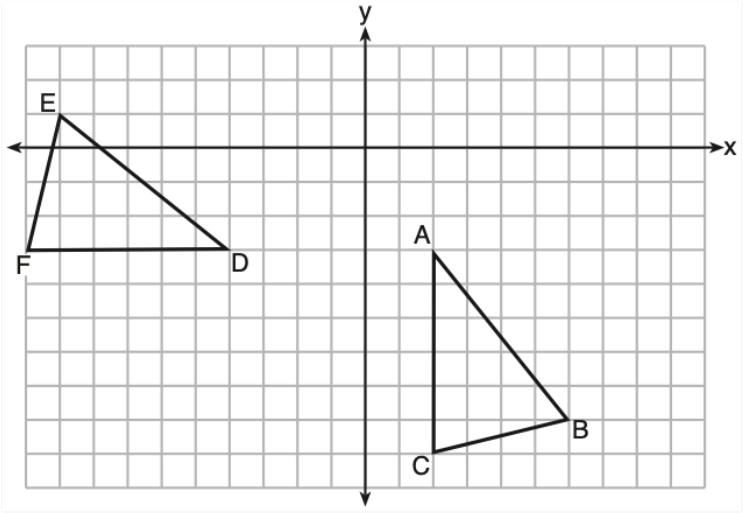
2. Convert this quadratic function from vertex form to standard form ($f(x) = x^2 + bx + c$) by expanding the squared term and simplifying.

$$f(x) = (x - 5)^2 - 1$$

3. Regent problem: Line segment $A'B'$, whose endpoints are $(4, -2)$ and $(16, 14)$, is the image of $\overline{AB}$ after a dilation of $\frac{1}{2}$ centered at the origin. What is the length of $\overline{AB}$?

4. Regent problem:

   The grid below shows $\triangle ABC$ and $\triangle DEF$.



   Let $\triangle A'B'C'$ be the image of $\triangle ABC$ after a rotation about point A. Determine and state the location of B' if the location of point C' is (8,–3). Explain your answer.

Classwork: Algebra efficient solutions

1. To solve for x, what would be the best first step?

   Write down one of the following: distribute, multiply (both sides) by 5, multiply by x, multiply by 3, multiply by $\frac{3}{2}$, factor, substitute for x, collect like terms.

   (a) $\frac{1}{5}(10x + 5) = 3$ _____

   (b) $\frac{2}{3}(5 - x) = -4$ _____

   (c) $x^2 - 4x + 5x + 4x^2 - 7 = 15$ _____

   (d) $\frac{1}{3}(9x + 3) = 17$ _____

   (e) $g(x) = x^2 - 5x + 3$. Find $g(1)$. _____

   (f) $x^2 - 4x - 5 = 0$. _____

   (g) $\sin 31^\circ = \dfrac{5}{x}$. _____

   (h) $\cos 29^\circ = \dfrac{x}{5}$. _____

2. Write down the center and radius of each circle.

   (a) $(x - 3)^2 + (y - 1)^2 = 16$

   (b) $(x + 2)^2 + (y - 7)^2 = 3^2$

   (c) $(x - 5)^2 + y^2 = 121$

   (d) $(x + 2)^2 + (y - 3)^2 = 9^2$

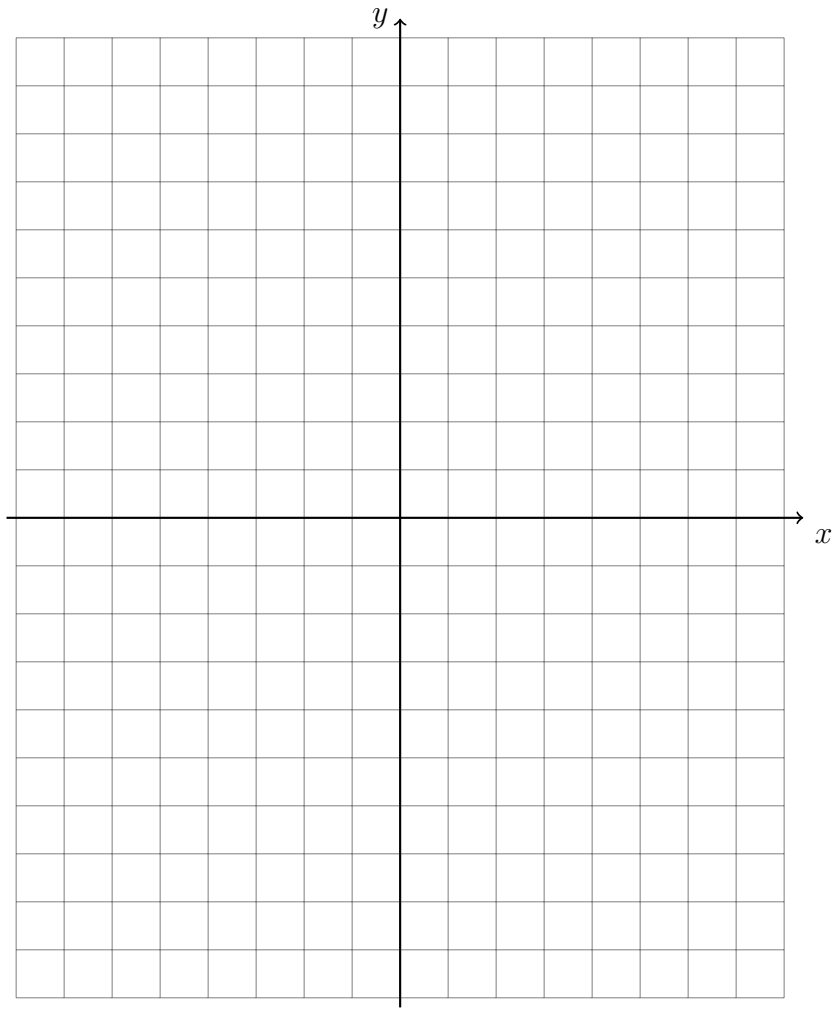
Classwork: Distance on the coordinate plane

1. Complete the t-chart for $x = -5, -4, -3, 0, 3, 4, 5$, then graph points on the grid below. Use pencil for graphs.

$$y = \sqrt{25 - x^2}$$

What is the shape of a smooth curve through the points?

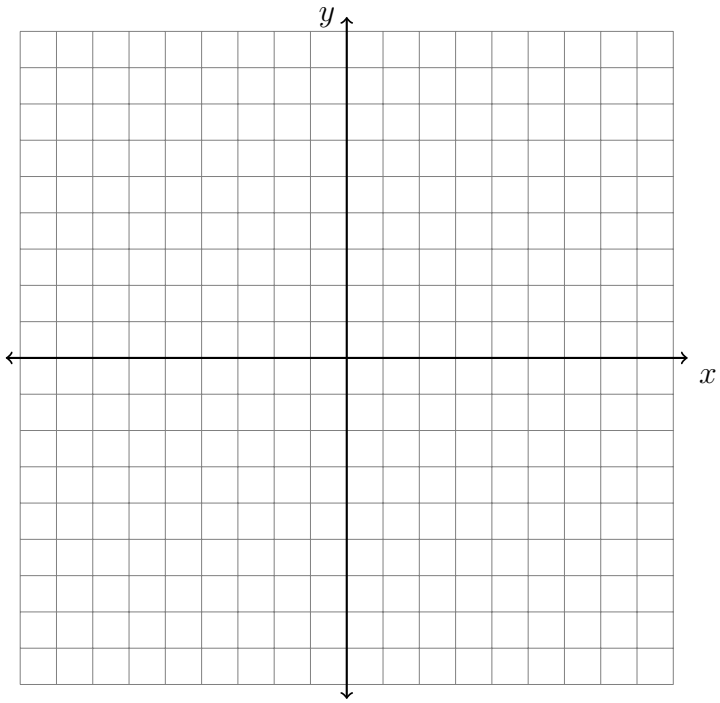
x	y



(a) Draw $\overline{OA}$ with $O(0, 0)$ and $A(-3, 4)$

(b) What is the length of $\overline{OA}$?

2. On the set of axes below, graph the quadrilateral $ABCD$ having coordinates $A(-3, -3)$, $B(5, 1)$, $C(6, 8)$, and $D(-2, 4)$.



Find the length of each side of the quadrilateral.