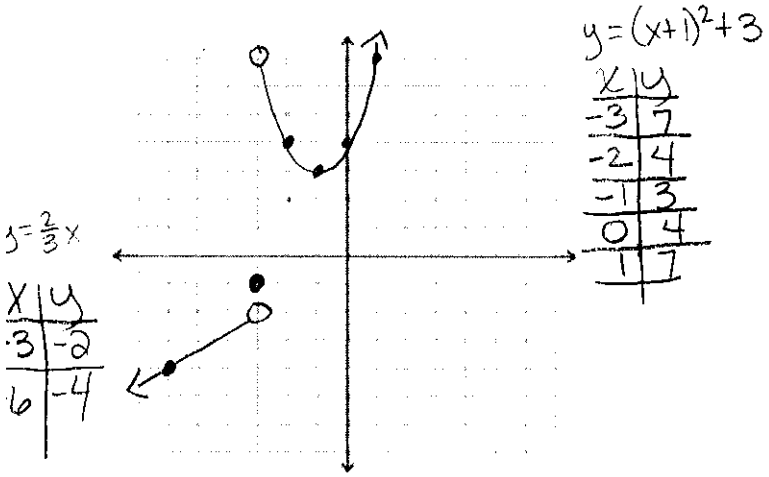
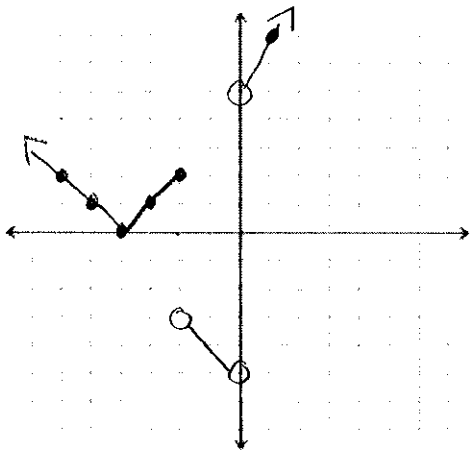
Graph the piecewise function:

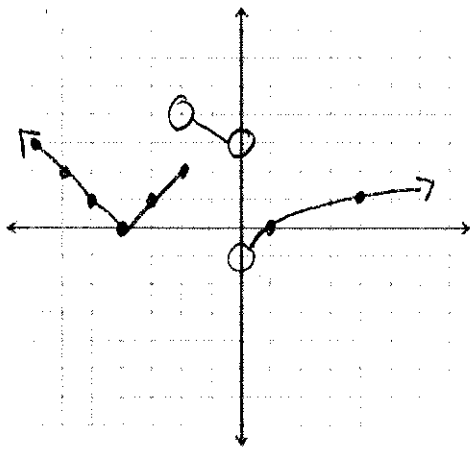
1. $\begin{cases} \frac{2}{3}x, & x < -3 \\ -1, & x = -3 \\ (x+1)^2 + 3, & x > -3 \end{cases}$



2. $\begin{cases} |x+4|, & x \le -2 \\ -x-5, & -2 < x < 0 \\ 2x+5, & x > 0 \end{cases}$

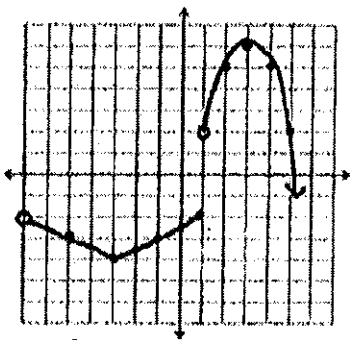


3. $\begin{cases} |x+4|, & x \le -2 \\ -\frac{1}{2}x+3, & -2 < x < 0 \\ \sqrt{x}-1, & x > 0 \end{cases}$



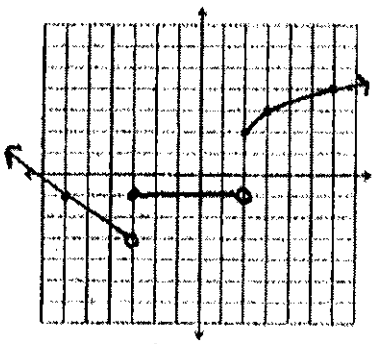
Write the piecewise function for the graphs below :

4.



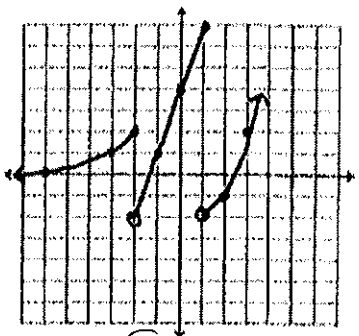
$f(x) = \begin{cases} \frac{1}{2}|x+3|-4, & -7 < x \le 1 \\ -(x-3)^2+6, & x > 1 \end{cases}$

5.



$f(x) = \begin{cases} -\frac{2}{3}x-5, & x < -3 \\ -1, & -3 \le x < 2 \\ \sqrt{x-2}+2, & x \ge 2 \end{cases}$

6.

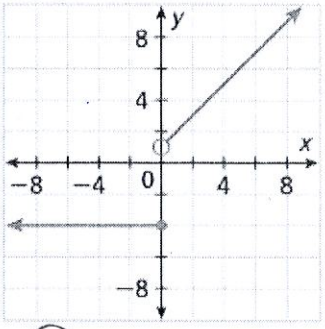


$f(x) = \begin{cases} -\sqrt{-x-2}+2, & x \\ 3x+4, & -2 < x \le \\ (x-1)^2-2, & x > 1 \end{cases}$

AP M Review for Final 2 Name: _____

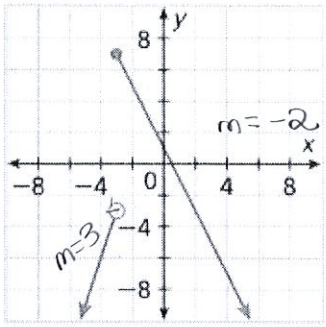
Write the equation for the piecewise function:

7.



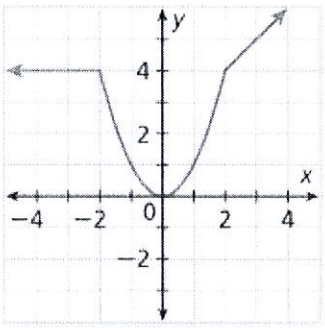
$f(x) = \begin{cases} -4, & x \le 0 \\ x+1, & x > 0 \end{cases}$

8.



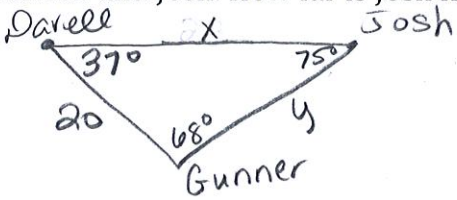
$f(x) = \begin{cases} 3x+6, & x < -3 \\ -2x+1, & x \ge -3 \end{cases}$

9.



$f(x) = \begin{cases} 4 & x \le -2 \\ x^2 & -2 < x \le 2 \\ x+2 & x \ge 2 \end{cases}$

10. In a paintball game, there are only three players left. Darnell and Gunner are on the same side and 20 ft apart. Josh forms an angle of 75° between Gunner and Darnell. Gunner forms a 68° angle between Darnell and Josh. How far is Josh from **both** Darnell and Gunner?



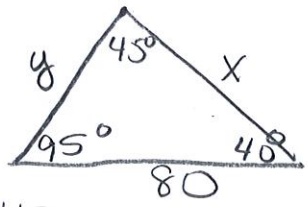
$\frac{\sin 75}{20} = \frac{\sin 68}{x}$ $x = 19.1978$ ft

$\frac{\sin 75}{20} = \frac{\sin 37}{y}$ $y = 12.46$ ft

11. Rick and Carl want to plant corn along the edges of a triangular plot of land at the prison. Two of the angles of the triangle measure 95° and 40°. The side between these two angles is 80 feet long.

a. Find the measure of the third angle.

$180 - 95 - 40 = 45°$



b. Find the length of the other two sides of the triangle.

$\frac{\sin 45}{80} = \frac{\sin 95}{x}$ $x = 112.707$ ft

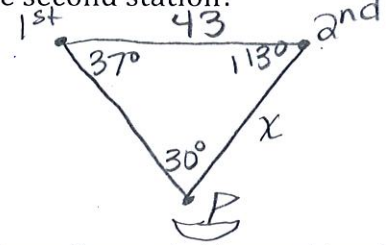
$\frac{\sin 45}{80} = \frac{\sin 40}{y}$ $y = 72.723$ ft

c. What is the perimeter of this triangular plot of land?

$80 + 112.707 + 72.723$

$= 265.43$ ft

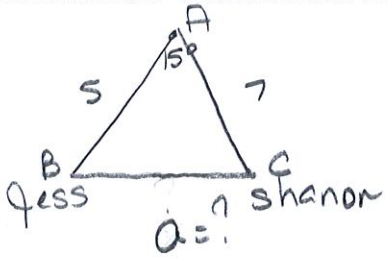
13. A ship is sighted from two radar stations 43 km apart. The angle between the line segment joining the two stations and the radar beam of the first station is 37°. The angle between the line segment joining the two stations and the beam from the second station is 113°. How far is the ship from the second station?



$\frac{\sin 30}{43} = \frac{\sin 37}{x}$

$x = 51.756$ km

14 During a figure skating routine, Jessica and Shannon skate apart with an angle of 15° between them. Jessica skates for 5 meters and Shannon for 7 meters. How far apart are the skaters?



$a^2 = b^2 + c^2 - 2bc\cos A$

$= 7^2 + 5^2 - 2(7)(5)\cos 15$

$\sqrt{a^2} = \sqrt{6.38519216}$

$a = 2.527$ meters

15. Given the function: $f(x) = \begin{cases} 2x - 5 \text{ if } x \leq 1 \\ 4 - 3x^2 \text{ if } x > 1 \end{cases}$

Find: $f(4) + 2f(-3) - 5f(1)$

$f(4) = 4 - 3(4)^2 = 4 - 3(16) = 4 - 48 = -44$

$f(-3) = 2(-3) - 5 = -6 - 5 = -11$

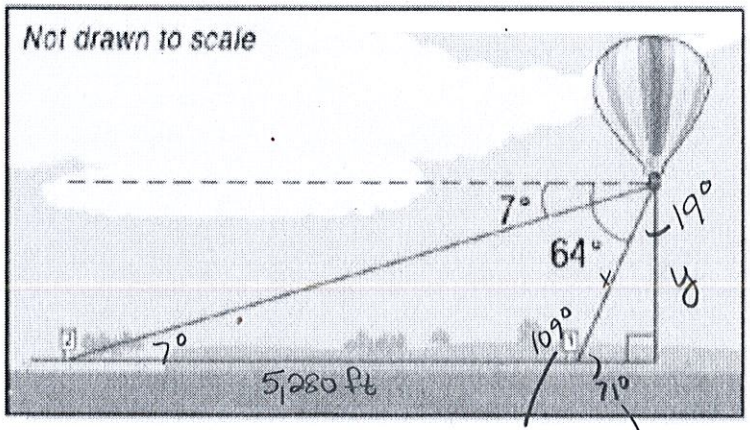
$f(1) = 2(1) - 5 = 2 - 5 = -3$

$-44 + 2(-11) - 5(-3)$

$-44 \quad -22 \quad +15$

$= -51$

16. A hot-air balloon crosses over a straight portion of interstate, its pilot eyes two consecutive mile posts on the same side of the balloon. How high is the balloon in ft?



$90 - 64 - 7 = 19°$

$180 - 71 = 109°$

$90 - 19 = 71°$

$\frac{\sin 7}{x} = \frac{\sin 64}{5{,}280}$

$\frac{x\sin 64}{\sin 64} = \frac{5{,}280\sin 7}{\sin 64}$

$x = 715.926$ ft

$\cos 19 = \frac{y}{715.926}$

$676.921 \text{ ft} = y$