

ACT
KMT

- ① A circle in the (x, y) coordinate plane has an equation of $(x-5)^2 + y^2 = 38$. What are the radius of the circle, in coordinate units, and the coordinates of the center of the circle?

RADIUS, CENTER

- (A) $\sqrt{38}$, $(5, 0)$ (B) 19 , $(5, 0)$
(C) 38 , $(5, 0)$ (D) $\sqrt{38}$, $(-5, 0)$
(E) 19 , $(-5, 0)$

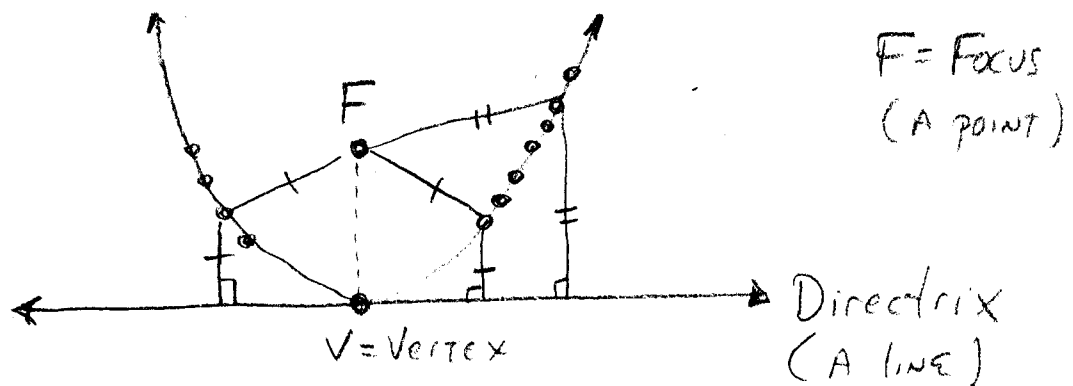
(ANS)

$$(x-5)^2 + (y-0)^2 = 38$$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$r = \sqrt{38} \quad \text{Center } (5, 0) \quad \text{ANS. (A)}$$

Geometry Definition of a Parabola



The locus of points in a plane
(locus)
that are equidistant from a point (F)
(equal)
and a line (the directrix).

BASIC CURVE FOUND IN NATURE

- PATH of objects in gravity
(no effect of wind)
- headlights, flashlights, LED's
- satellite dish, solar heater

Ch. 10-5 PARABOLAS

General Form: QUADRATIC FUNCTION

$$\textcircled{1} ax^2 + bx + c = y \quad \begin{array}{c} \curvearrowright \\ a+ \end{array} \quad \begin{array}{c} \curvearrowleft \\ a- \end{array}$$

$$\textcircled{2} ay^2 + by + c = x \quad \begin{array}{c} \curvearrowleft \\ a+ \end{array} \quad \begin{array}{c} \curvearrowright \\ a- \end{array}$$

NOT A FUNCTION

Standard (h,k) Form of $\textcircled{1} \Rightarrow (x-h)^2 = 4p(y-k)$

* $p = \text{distance from FOCUS TO VERTEX}$

Vertex (h, k) (See Pg 654)

GRAPH: $y = ax^2 + bx + c$

AOS $\Rightarrow$ Axis of Symmetry $\Rightarrow x = -\frac{b}{2a}$

Vertex $\Rightarrow \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$\textcircled{\text{EX}} \quad y = x^2 - 6x + 8$

$$0 = x^2 - 6x + 8$$

$$S \Rightarrow -6$$

$$P \Rightarrow 8$$

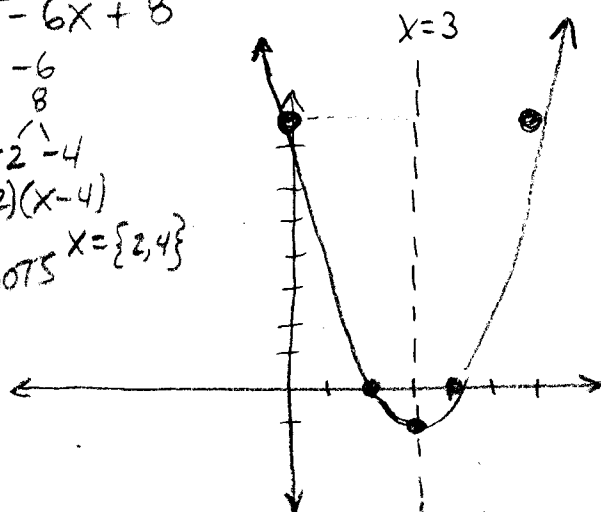
$$-2 \quad -4$$

$$0 = (x-2)(x-4)$$

$$\text{ROOTS } x = \{2, 4\}$$

x	y
3	-1
0	8
6	8
2	0
4	0

Symmetry



$$\text{AOS} \Rightarrow x = \frac{-(-6)}{2(1)} = 3$$

$$\text{Vertex} = (3, f(3)) = (3, -1)$$

$$x = \frac{-b \pm \sqrt{d}}{2a}$$

AOS