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## Axis of symmetry parabola math

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The symmetry axis (Parabola) The symmetry axis of The Parabola is the line in respect of which the parabola is symmetrical. If the parabola is vertical, the symmetry of the line is vertical. If there is an slant at the coordinate level, the parabola and the corresponding symmetry axis shall be vertical. STANDARD FORM Parabola graph, represented by a rectangular function  $y = a(x-p)^2 + q$ , is the symmetrical axis represented by the result of the vertical line  $x = p$ . GENERAL FORM formula, FACTORED form When you kick a football (or shoot an arrow, fire a rocket or throw a stone) it arcs up into the air and comes down again ..... after tea parabola! (Except for how the air affects it.) Try kicking the ball: Definition A parabola is a curve where any point is at an equal distance: fixed point (focus) and fixed straight line (directrix) Get a piece of paper, draw a straight line, then make a large point of focus (not a line). Now play some measurements until you have another dot that has exactly the same distance between focus and straight line. Continue until you have many little points, then join the little points and you have parabola! Names Here are the important names: directrix and focus (explained above) axis symmetry (goes through focus, right angle directrix) peak (where parabola makes its sharpest turn) is half-focus and directrix. The reflector and parabola have this amazing feature: Each ray parallel axis symmetry can be reflected from the surface directly to focus. And that explains why this dot is called focus ..... because this is where all the rays get focused! So parabola can be used: satellite dishes, radar dishes, focusing on the sun's rays to make a hot spot, reflective spotlights and torches, etc. We also get parabola when we slice through the cone (the slice must be parallel to the side of the cone). So parabola is a tapered section (part cone). Equations The easiest equation of parabola is  $y = x^2$  On the side becomes  $y^2 = x$  (or  $y = \sqrt{x}$  only the top half) Slightly more general:  $y^2 = 4ax$ , where  $a$  is the distance from the origin of the focus (and also the origin of directrix) Converting  $y^2 = 5x$   $y^2 = 4ax$  form, we can  $y^2 = 4(5/4)x$ , so  $a = 5/4$  and focus on  $y^2 = 5x$  is: equations parabolas in different are:  $y^2 = 4ax$   $y^2 = -4ax$   $x^2 = 4ay$   $x^2 = -4ay$  Parabolic cup measurements If you want to build a parabolic cup with a focus 200 mm above the surface, what measurements do you need? To make it easy to build, let's have it point upwards, and so we choose the  $x^2 = 4ay$  equation. And we want  $a$  to be 200, so that the equation changes:  $x^2 = 4ay = 4 \times 200 \times y = 800y$  Rearrange so that we can calculate the heights:  $y = x^2/800$  And here are some height measurements, when you start along: Distance Along (x) Height (X) Height (y) 0 mm 0.0 mm 100 mm 12.5 mm 200 mm 50.0 mm 300 mm 300 mm 112.5 mm 400 mm 200.0 mm 500 mm 312.5 mm 600 mm 450.0 mm Try to build it yourself, it can be fun! Be careful, a reflective surface can focus on a lot of heat. Copyright © 2018 MathsFun.com Figure 2, which is the symmetry axis equation? Figure 2 This is the line  $x = 2$  In Graph 3, what is the symmetry axis equation? Figure 3 This is the line  $x = -1$  The graph of the self-metric function is parabola. The parabola symmetry is a vertical line that divides the parabola into two concurrent halves. Axis symmetry always passes through the peak of the parabola. The x-coordinate of Vertex is the equation of the parabola symmetry axis. For the rectangular function of the standard form  $y = a x^2 + b x + c$  is the vertical line  $x = -b/2a$ . Example 1: Find the axis of symmetry of the parabola shown. The x-coordinate of Vertex is the equation of the parabola symmetry axis. The peak of the parabolic is (2, 1). So, the axis symmetry is line  $x = 2$ . Example 2: Use the formula to find the symmetry axis of the graph  $y = x^2 - 6x + 5$ . For the rectangular function of the standard form  $y = a x^2 + b x + c$  is the vertical line  $x = -b/2a$ . Here,  $a = 1$ ,  $b = -6$  and  $c = 5$ . Substitute.  $x = -(-6)/2(1)$  Simplify.  $x = 6/2 = 3$  Thus the symmetry axis is  $x = 3$ .

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