

## MIRROR CURVATURE

### Teaching Guidelines

**Subject:** Mathematics

**Topics:** Algebra, Quadratic Functions

**Grades:** 6 - 9

**Knowledge and Skills:**

- Can recognize a parabolic shape
- Can relate the coefficients of a quadratic function to their influence on the shape and position of the parabolic graph of that function
- Can determine the equation of a quadratic function that closely matches a set of points

**Answers:**

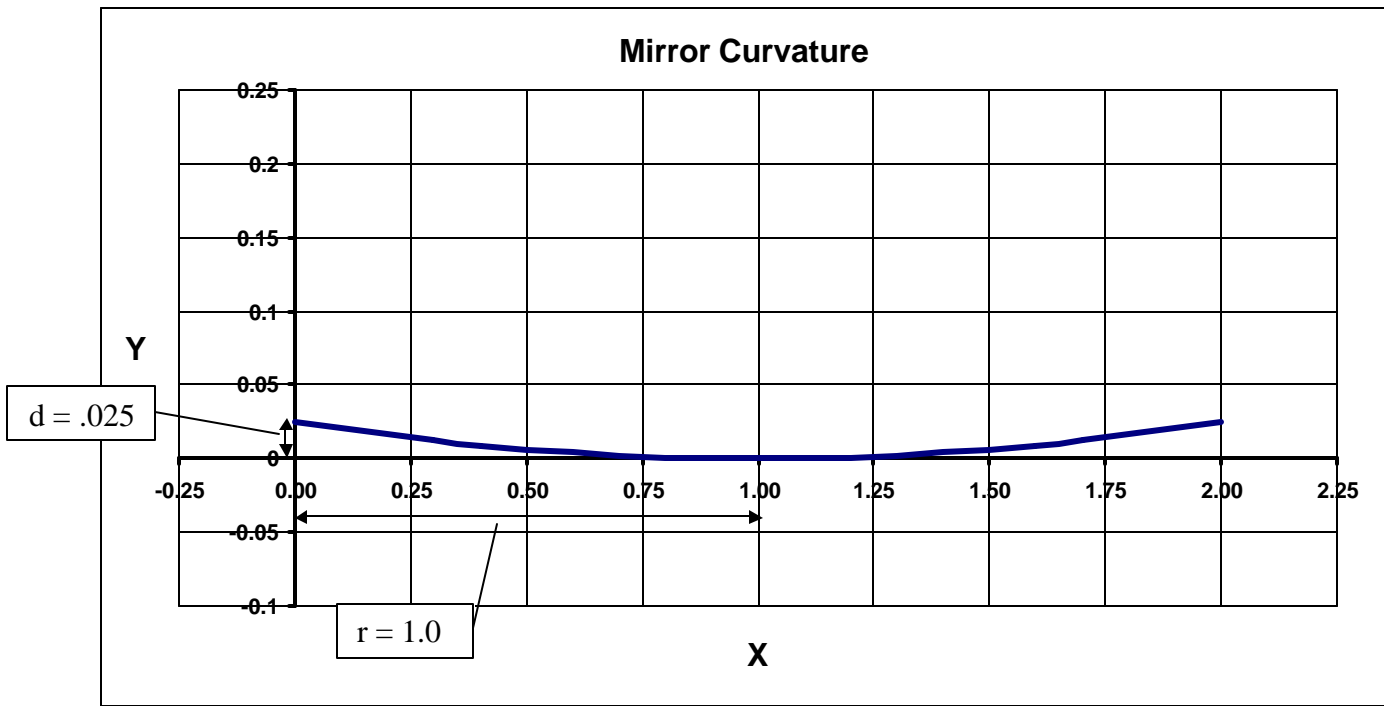
1.  $y = .025x^2 - .05x + .025$

2.

<i>r</i>	<i>d</i>	Equation
1.2	.025	$y = .025x^2 - .06x + .036$
1.4	.025	$y = .025x^2 - .07x + .049$
1.6	.025	$y = .025x^2 - .08x + .064$
1.8	.025	$y = .025x^2 - .09x + .081$
2.0	.025	$y = .025x^2 - .1x + 0.1$
1.0	.020	$y = .020x^2 - .04x + .02$
1.0	.022	$y = .022x^2 - .044x + .022$
1.0	.028	$y = .028x^2 - .056x + .028$
1.0	.030	$y = .030x^2 - .06x + .03$
2.0	.030	$y = .030x^2 - .12x + .012$
2.5	.040	$y = .040x^2 - .02x + .025$
3.0	.050	$y = .050x^2 - .035x + .045$

## Mirror Curvature

The graph below represents the curvature of a large telescope mirror. In this case the depth of the mirror,  $d$ , is .025 meters, and the radius of the mirror,  $r$ , is 1.0 meters.



1) Find the equation for this curve.

2) Find the equations for curves with these values of  $r$  and  $d$ :

$r$	$d$	Equation
1.2	.025	
1.4	.025	
1.6	.025	
1.8	.025	
2.0	.025	
1.0	.020	
1.0	.022	
1.0	.028	
1.0	.030	
2.0	.030	
2.5	.040	
3.0	.050	

3) Create a graph for each of the above curves.