Name _____
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Trigonometry
Parabolas Review

For each parabola, identify the vertex, focus, and directrix. Then graph.

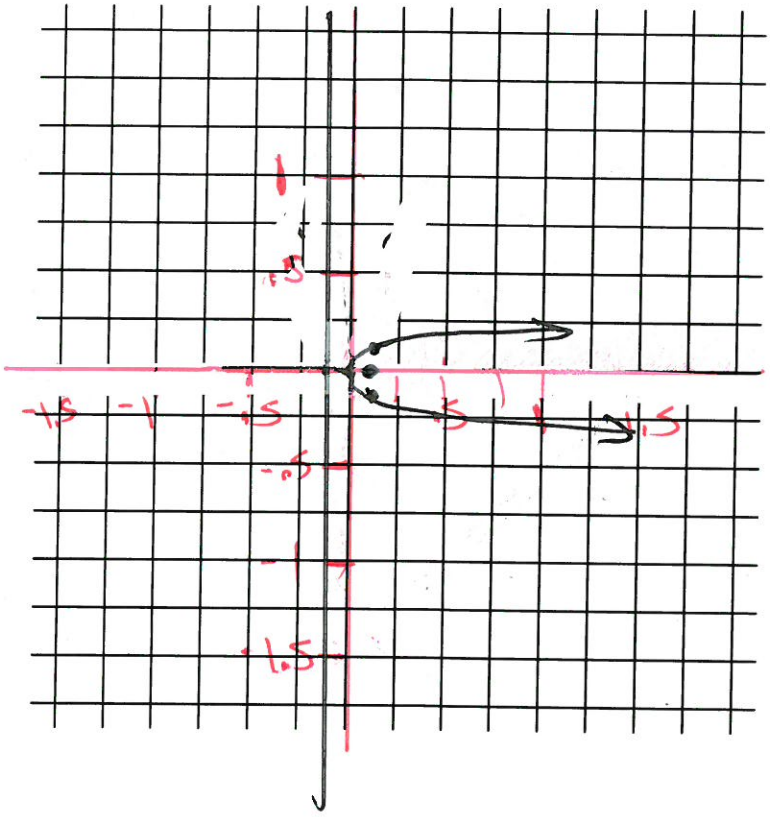
1. $x = 4y^2$ $\frac{1}{4}x = y^2$

vertex (0,0)

focus $(\frac{1}{16}, 0)$

directrix $x = -\frac{1}{16}$

$4p = \frac{1}{4}$
$p = \frac{1}{16}$



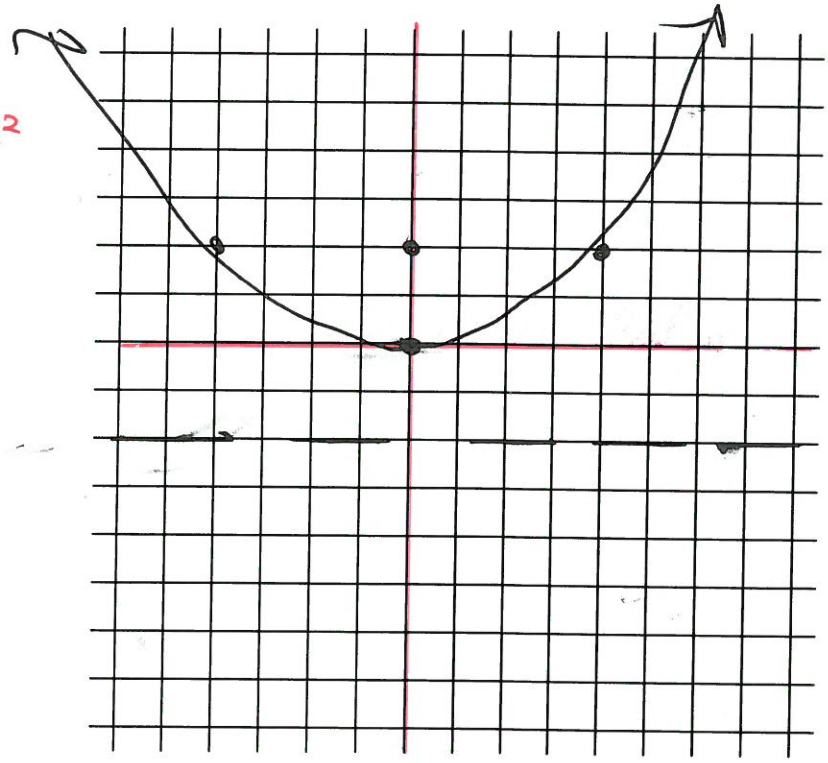
2. $x^2 - 8y = 0$ $8y = x^2$

vertex (0,0)

focus (0,2)

directrix $y = -2$

$4p = 8$
$p = 2$



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$y^2+6y+9 = -8x-25+9$

3. $y^2+6y+8x+25=0$

$(y+3)^2 = -8x-16$

$(y+3)^2 = -8(x+2)$

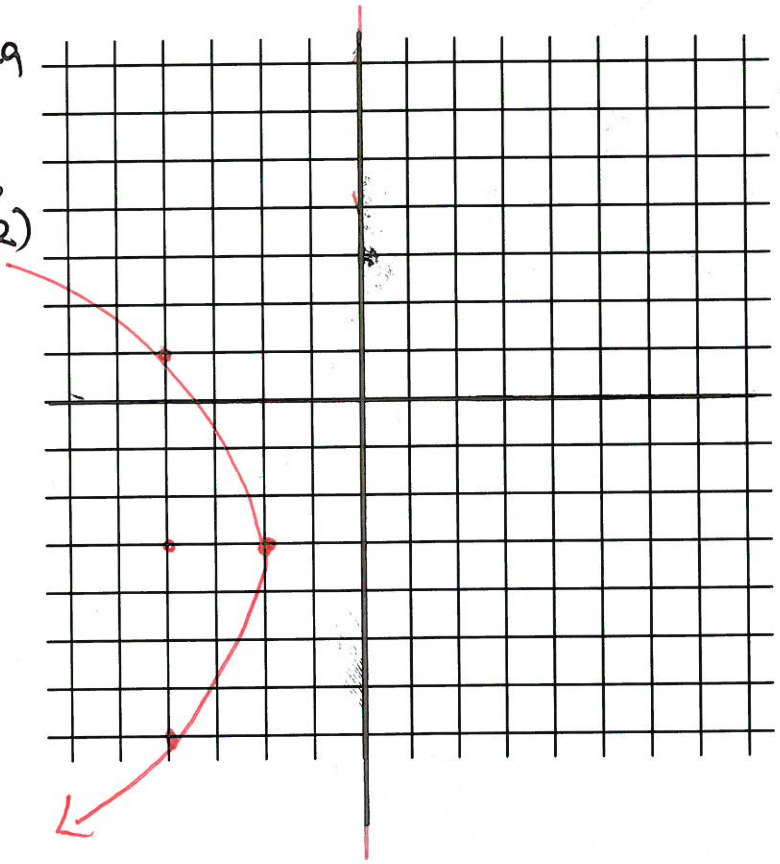
vertex $(-2,-3)$

focus $(-4,-3)$

directrix $x=0$

$4p=-8$

$p=-2$



4. $y=\frac{1}{4}(x^2-2x+5)$

$4y = x^2-2x+5$

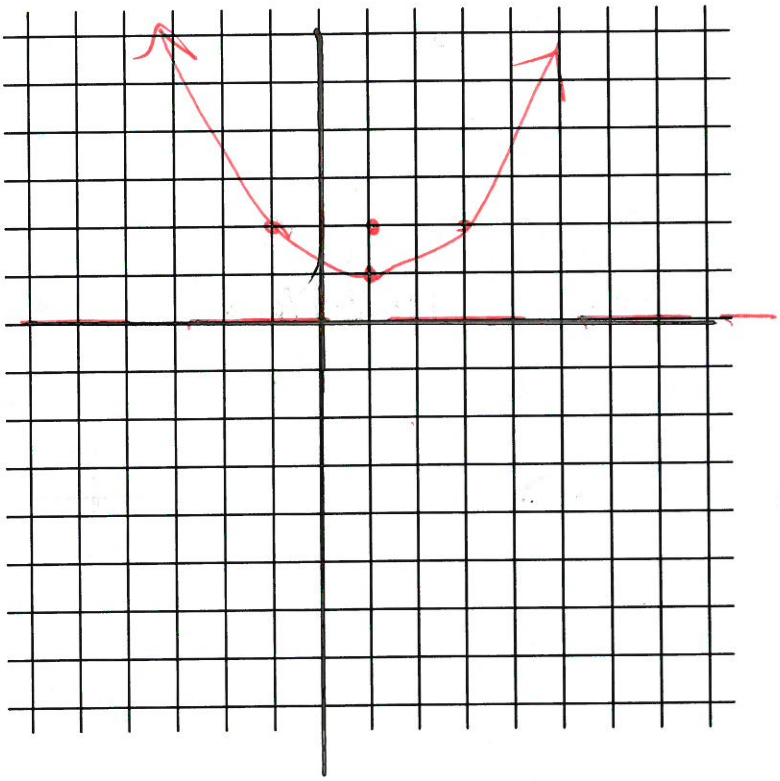
$4(y-1) = (x-1)^2$

vertex $(1,1)$

focus $(1,2)$

directrix $y=0$

$p=1$



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Trigonometry
Parabolas Review

Find the equation (in standard form) of the specified parabola.

5. Vertex $(0,0)$ Focus $\left(0,-\frac{3}{2}\right)$

$p=-\frac{3}{2}$ $4p=4\left(-\frac{3}{2}\right)=-6$ $-6y=x^2$

6. Vertex $(3,2)$ Focus $(1,2)$

$p=-2$
$4p=-8$
$-8(x-3)=(y-2)^2$

7. Directrix $y=2$ Focus $(0,6)$

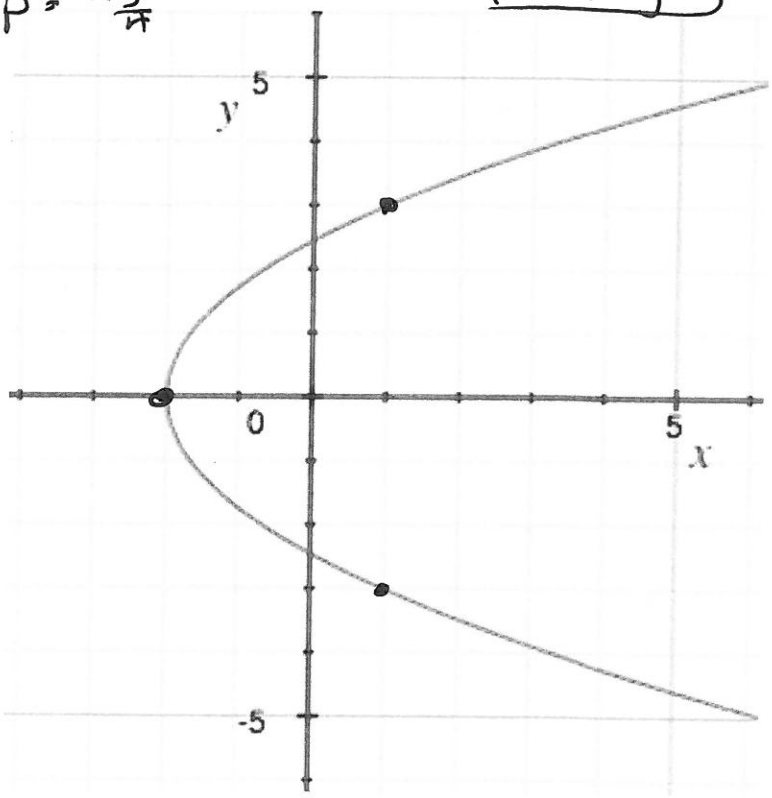
$V(1,6)$
$p=-1$
$4p=-4$
$-4(y-6)=(x-1)^2$

8. Vertex at $(0,0)$ and through $(3,-3)$

$4py=x^2$
$4p(-3)=3^2$
$-12p=9$
$p=-\frac{3}{4}$
$-3y=x^2$

$4px=y^2$
$4p(3)=9$
$p=\frac{9}{12}=\frac{3}{4}$
or $3x=y^2$

9.



$V(-2,0)$
$pt(1,3)$
$4p(x+2)=y^2$
$4p(1+2)=3^2$
$12p=9$
$p=\frac{3}{4}$
$3(x+2)=y^2$

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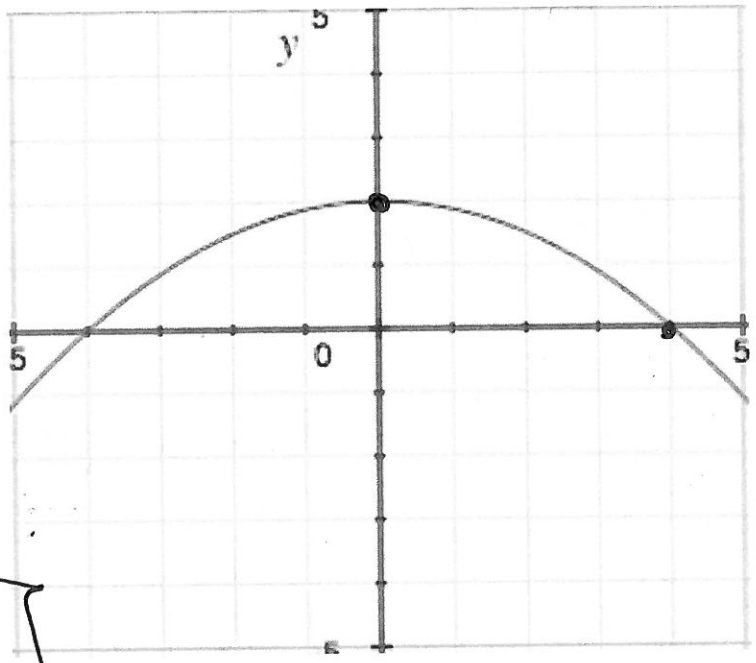
Trigonometry
Parabolas Review

10.



$V(0,2)$

pt $(4,0)$

$4p(y-2)=x^2$

$4p(-2)=(4)^2$

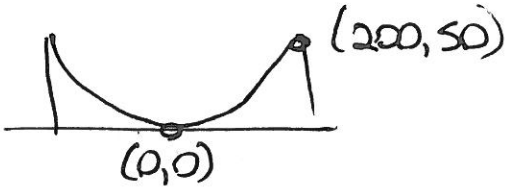
$-8p=16$

$p=-2$

$-8(y-2)=x^2$

Applications

11. Each cable of a suspension bridge is suspended in the shape of a parabola between 2 towers that are 400 feet apart and 50 feet above the road. The cable touch the road midway between the towers. Find an equation for the bridge. Find the length of the vertical supporting cable when x is 100 feet.



$4py = x^2$

$4p(50) = 200^2$

$200p = 200^2$

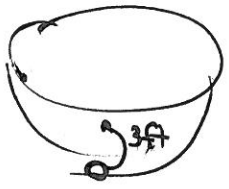
$p = 200$

$800y = x^2$

$800y = (100)^2$

$y = 12.5\text{ ft}$

12. The receiver in a parabolic dish antenna is 3 feet from the vertex and is located at the focus. Find the equation of a cross section of the reflector.



$p = 3\text{ft}$

$12y = x^2$