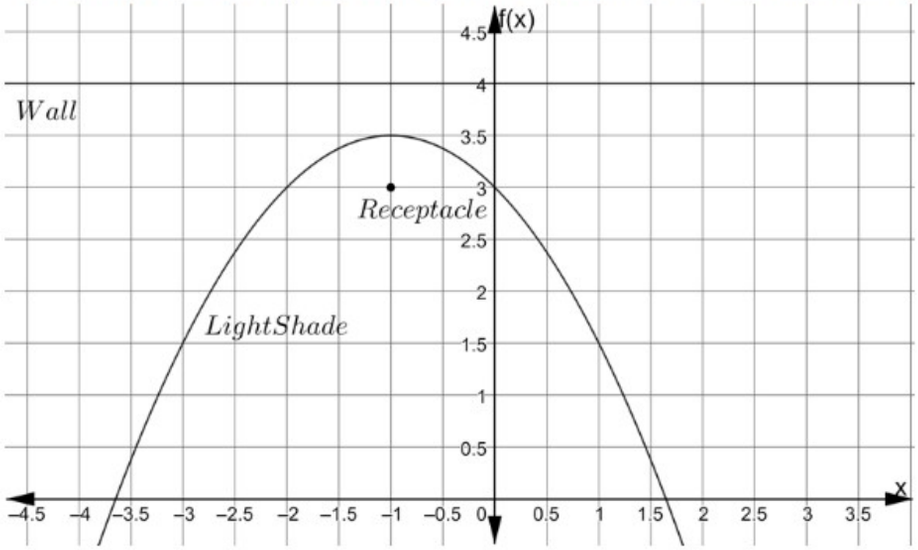
TOPIC 7: WRITING QUADRATIC EQUATIONS WHEN GIVEN A FOCUS AND DIRECTRIX - 5/7/FR



The 2-dimensional sketch of a parabolic light shade is shown. The bulb receptacle is placed at $(-1, 3)$ and the wall, which must be the same distance away from the light shade as the receptacle, is at $y = 4$. What is the equation of the quadratic that is the outline of the light shade?

Answer:

$y =$ $-\frac{1}{2}x^2 - x + 3$

$\sqrt{(x+1)^2+(y-3)^2} = \sqrt{(y-4)^2}$

$x^2+2x+1+y^2-6y+9 = y^2-8y+16$

$x^2+2x+1-6y+9 = -8y+16$

$x^2+2x+10-6y = -8y+16$

$-16 \quad +8y \quad +6y \quad -16$

$x^2+2x-6 = -2y$

TOPIC 7: WRITING QUADRATIC EQUATIONS WHEN GIVEN A FOCUS AND DIRECTRIX - 5/7/DD

The equation of the parabola with the focus $(-4, 1)$ and the directrix $y = -1$ is

A $\frac{x^2}{4} - 2x + 4$

$\frac{x^2}{4} + 2x + 4$

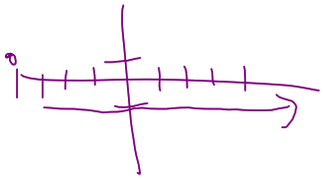
C $x^2 + 2x + 4$

and has the vertex

(-4,0)

B (4,0)

C (0,-4)



$\sqrt{(x+4)^2 + (y-1)^2} = \sqrt{(y+1)^2}$

$x^2 + 8x + 16 + y^2 - 2y + 1 = y^2 + 2y + 1$

$x^2 + 8x + 17 - 2y = 2y + 1$

$-1 \quad +2y \quad +2y \quad -1$

$\frac{x^2 + 8x + 16}{4} = \frac{4y}{4}$

Question 3 of 8

TOPIC 8: SYSTEMS OF EQUATIONS WITH QUADRATICS - PART 1 - 5/8/FR

Consider the system.

$f(x) = x^2 - 7x + 5$
$g(x) = 3x - 20$

For what value of x is $f(x) = g(x)$?

Answer:

$x = 5$

$x^2 - 7x + 5 = 3x - 20$
$-3x + 20 \quad -3x + 20$

$x^2 - 10x + 25 = 0$

$\frac{10 \pm \sqrt{10^2 - 4(1)(25}}{2(1)} = \frac{10 \pm \sqrt{100 - 100}}{2}$

$\frac{10}{2} = 5$

TOPIC 9: SYSTEMS OF EQUATIONS WITH QUADRATICS-PART 2 - 5/9/DD

Janel and Fred each throw a ball. The vertical heights of the balls, in meters, after t seconds are modeled by the system below.

$f(t) = 45 - 5(t-3)^2$
$g(t) = 45 - 5(t-1)^2$

$45 - 5(t-3)^2 = 45 - 5(t-1)^2$

$t^2 - 6t + 9 = t^2 - 2t + 1$

$+6t \quad -1 \qquad +6t \quad -1$

$8 = 4t$

The balls collide at

(A) 1

(2) 2

(C) 3

seconds at a height of

(A) 45

(40) 40

(C) 35

$45 - 5(2-1)^2$

$45 - 5 = 40$

meters.

TOPIC 9: SYSTEMS OF EQUATIONS WITH QUADRATICS-PART 2 - 5/9/FR

Alicia is constructing a sculpture of two glass parabolic structures joined at one point. She models the parabolas with the functions, $f(x) = (x+3)^2 - 1$ and $g(x) = 7 - (x-1)^2$. At what x-value are the two parabolas joined?

Answer:

$x =$ -1

$x^2+6x+9-1 = 7-(x^2-2x+1)$

$x^2+6x+8 = 7-x^2+2x-1$

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

$+x^2-2x-6$

$2x^2+4x+2=0$

$2(x^2+2x+1)=0$

$\frac{-2 \pm \sqrt{2^2-4(1)(1)}}{2(1)} = \frac{-2}{2} = -1$

TOPIC 12: KEY FEATURES OF QUADRATIC FUNCTIONS - 5/12/MC

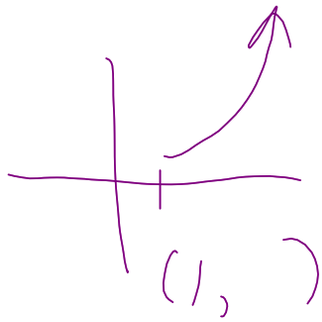
A quadratic function is increasing over the interval $(1, \infty)$. Which of the following could be the equation of the function?

(A) $f(x) = (x-1)^2 - 4$

(B) ~~$f(x) = (x-4)^2 + 1$~~

(C) $f(x) = -(x-1)^2 - 4$

(D) ~~$f(x) = -(x-4)^2 + 1$~~



TOPIC 13: CLASSIFYING QUADRATIC FUNCTIONS AND FINDING INVERSES - 5/13/MS

Two functions $f(x)$ and $g(x)$ are defined as:

$f(x) = x^2 + 12x + 38$ for $x \geq -6 g(x) = \sqrt{x-2} - 6$

$\sqrt{x^2+12x+38-2} - 6$

$\sqrt{x^2+12x+36} - 6$

$\sqrt{(x+6)^2} - 6$

$x+6-6$

$= x$

Which statements are correct? Select all that apply.

- [ ] $f(g(x)) = g(f(x)) = 1$
- [x] $f(g(x)) = g(f(x)) = x$
- [x] $f(x)$ and $g(x)$ are inverse functions.
- [ ] For $f(x)$ and $g(x)$ to be inverses, $g(x)$should be equivalent to $\frac{1}{f(x)}$.
- [x] For $f(x)$ and $g(x)$ to be inverses, the restriction on $f(x)$ should be $x \leq -6$.

36 | 12

6(6) | 6+6