Hidden World of Parabolas

Team 6
eTwinning collaborative presentation

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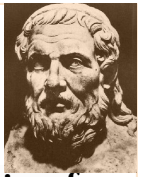
TASK:

Each student write a task for the quiz with multiple answers (we prefer 4).

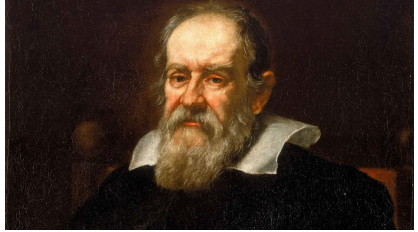
You can add interesting things about the parabola, some pictures, illustrations, ...

The Name "Parabola"



The Greek mathematician Apollonius of Perga (third to second centuries B.C.) is credited with naming the parabola. "Parabola" is from the Greek word meaning “exact application,” which, according to the Online Dictionary of Etymology, is “because it is produced by ‘application’ of a given area to a given straight line.”

A Task with Answers:



Which of the following is correct for the vertex of the parabola f(x) = 2x2 + 8x - 12 ?

A:There is a local minimum at (-2, -20)

B:There is a local maximum at (-2, -20)

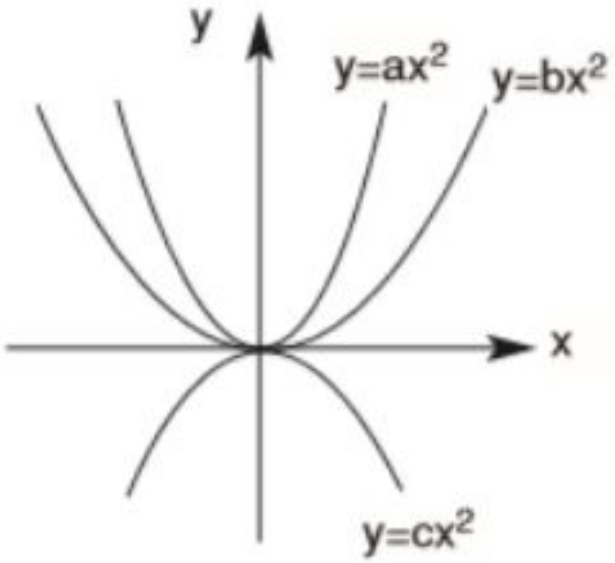
C:There is a local minimum at (2, 12)

Author: Boško Stojković, II7

Galileo and Projectile Motion
In Galileo's time, it was known that bodies fall straight down according to the rule of squares: The distance traveled is proportional to the square of the time. However, the mathematical nature of general path of projectile motion was not known. With the advent of cannons, this was becoming a topic of importance. By recognizing that horizontal motion and vertical motion are independent, Galileo showed that projectiles follow a parabolic path. His theory was eventually validated as a special case of Newton's law of gravitation.

A Task with Answers:

2.



Which of the following is correct according to the parabola graphics given in the figure?

A) b > a > c

C) a > c > b

B) c > a > b

D) a > b > c

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A Task with Answers:

3.

Axis of Symmetry:

Axis of symmetry is a vertical line through the vertex of the curve. The curve is symmetrical about this line. When the quadratic is in normal form, we can find the axis of symmetry from the formula below.

$$x=\frac{-b}{2a}$$

$$f(x)=2mx^2+(m-5)x+4$$

Since the symmetry axis of the parabola f (x) is x = 1, what is m?

A) -2 B) -1 C) 1 D) 2

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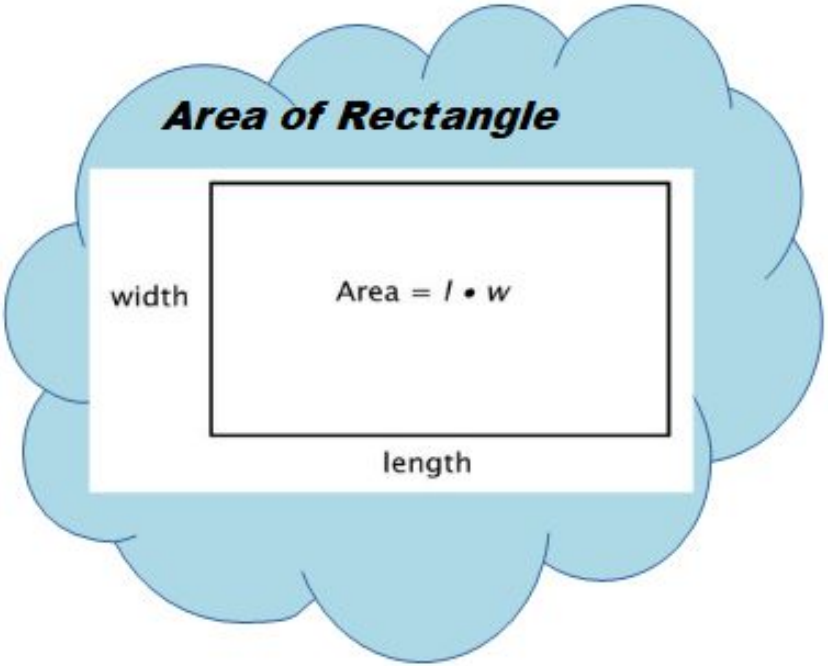
A Task with Answers:

4.



x is a positive real number. What is the maximum area of a rectangle with sides x cm and 24-6x cm?

A) 36 cm²

B) 32 cm²

C) 24 cm²

D) 20 cm²

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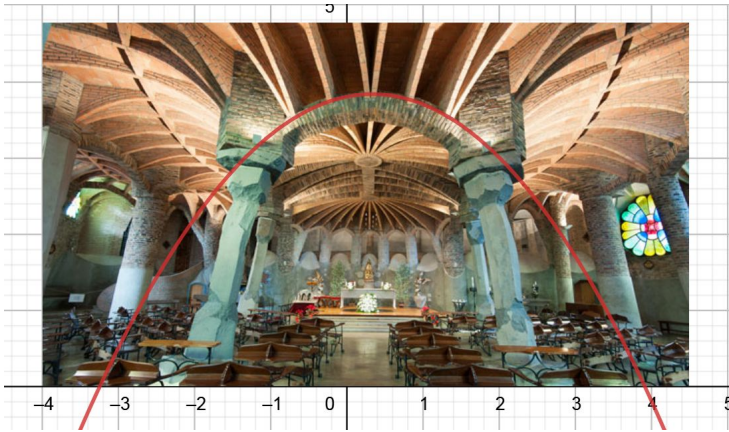
A Task with Answers:

5. Which of the following numbers is the larger solution of the equation $2x^2 = 7x - 3$?

A) -3
B) -0.5
C) 0.5
D) 3

$f(x) = -0.3x^2 + 0.2x + 3.8$

In the picture you can see inside the church Colònia Güell

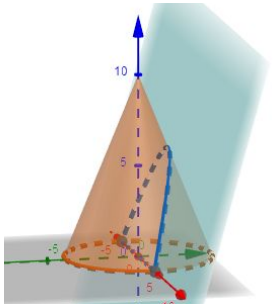


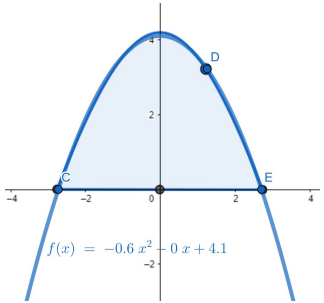
which is located in famous park "Park Güell" in Barcelona.

Author: Ana Paparić, Srednja škola Markantuna de Dominisa Rab

A Task with Answers:

6.





When a cone is cut with a plane as in the figure, a parabola with the equation $f(x)=-0,6x^2+4,1$ is obtained. So what is f(1)?

A)3 B)3,5 C)4 D)4,1

Apollonius' Cone Sections

Apollonius (262-190 BC) showed that if we slice a cone with a plane, we would get three different geometric shapes depending on the angle the plane made with the ground plane. These are circle, ellipse, and parabola.

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A Task with Answers:

7. What is the sum of the coordinates of the points where the parabola given by the $f(x)=2x^2-6x+4$ equation crosses the x axis?

A)-3 B)-1 C)2 D)3

In architecture, parabola is used in structures such as mosque dome, portico, bridge, inner carrier column, opera house.

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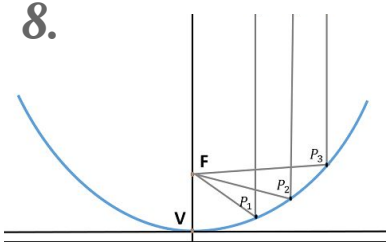
A Task with Answers:

8.



At the focus of a parabolic surface modeled by the equation $f(x)=0,15x^2$, there is a light bulb.

A beam coming out of this light bulb hits the parabolic surface and proceeds along the line x = 2. According to this, what is the ordinate of the point where the beam hits the parabolic surface?

A)0,3 B)0,6 C)0,9 D)1

It consists of headlight, parabola mirror or reflector, headlight glass with diffusing feature and light source. The parabola mirror reflects the light into a bundle and increases its intensity. The headlight glass distributes the light from the reflector in the desired direction. As a light source, halogen bulbs, two filament bulbs or xenon headlight systems are used.

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Dear team partners,

Thank you!