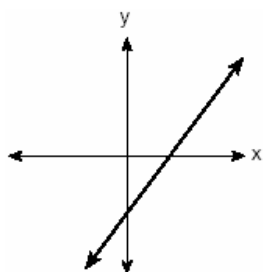


NAME: _____

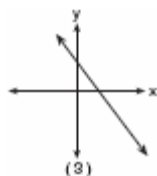
1. 010414b, P.I. A2.A.52

The graph below represents $f(x)$.

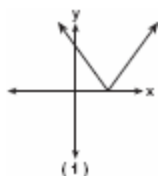


Which graph best represents $|f(x)|$?

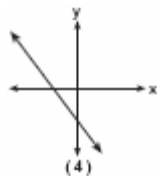
[A]



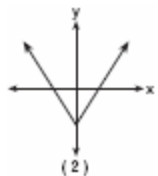
[B]



[C]



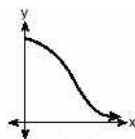
[D]



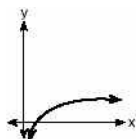
2. 080304b, P.I. A2.A.52

The strength of a medication over time is represented by the equation $y = 200(1.5)^{-x}$, where x represents the number of hours since the medication was taken and y represents the number of micrograms per millimeter left in the blood. Which graph best represents this relationship?

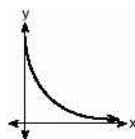
[A]



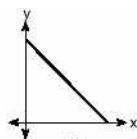
[B]



[C]



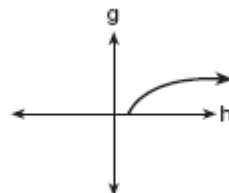
[D]



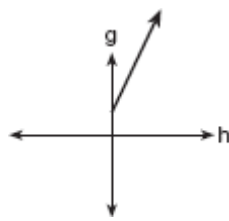
3. 010420b, P.I. A2.A.52

The cells of a particular organism increase logarithmically. If g represents cell growth and h represents time, in hours, which graph best represents the growth pattern of the cells of this organism?

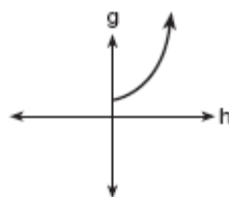
[A]



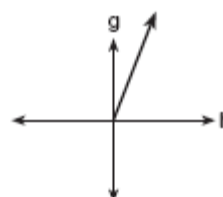
[B]



[C]



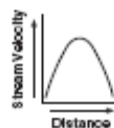
[D]



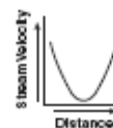
4. 060408b, P.I. A2.A.52

Which graph represents an inverse variation between stream velocity and the distance from the center of the stream?

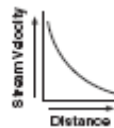
[A]



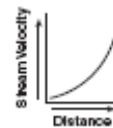
[B]



[C]



[D]

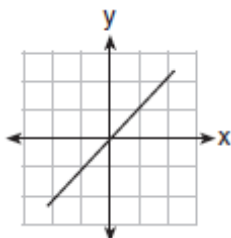


NAME: _____

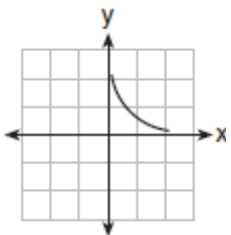
5. 080913b, P.I. A2.A.52

Jack is driving from New York to Florida. The number of hours that he drives and the speed at which he drives are inversely proportional. Which graph could be used to describe this situation if one axis represents speed and the other represents hours?

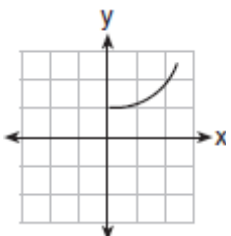
[A]



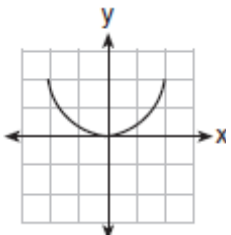
[B]



[C]



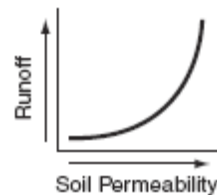
[D]



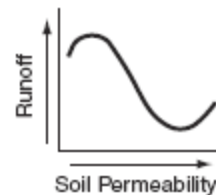
6. 010603b, P.I. A2.A.52

Which graph shows that soil permeability varies inversely to runoff?

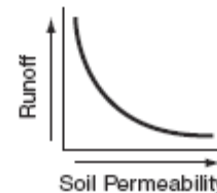
[A]



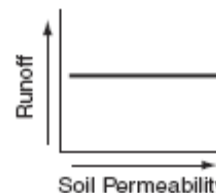
[B]



[C]



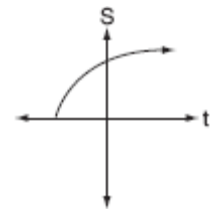
[D]



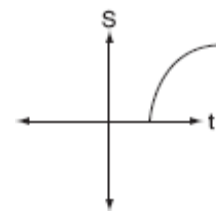
7. 060718b

The formula $S = 20\sqrt{t + 273}$ is used to determine the speed of sound, S , in meters per second, near Earth's surface, where t is the surface temperature, in degrees Celsius. Which graph best represents this function?

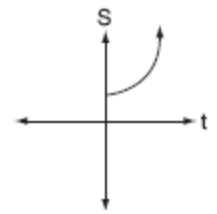
[A]



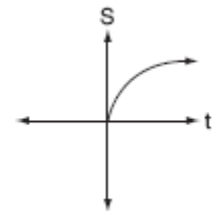
[B]



[C]



[D]

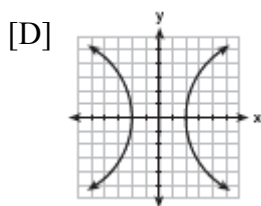
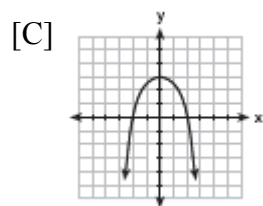
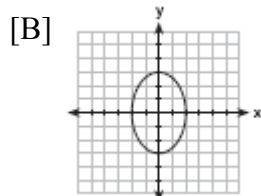
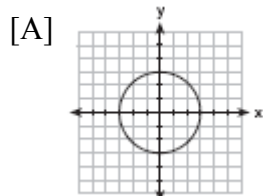


NAME: _____

8. 010917b, P.I. A2.A.52

Which graph represents the equation

$$9x^2 = 36 - 4y^2?$$

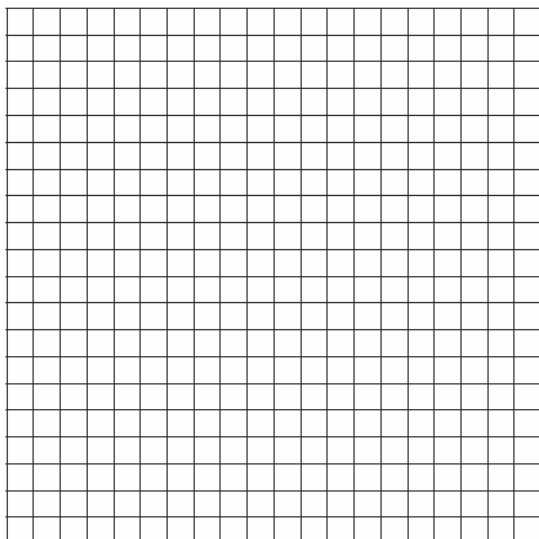


9. 080229b

A rock is thrown vertically from the ground with a velocity of 24 meters per second, and it reaches a height of $2 + 24t - 4.9t^2$ after t seconds. How many seconds after the rock is thrown will it reach maximum height, and what is the maximum height the rock will reach, in meters? How many seconds after the rock is thrown will it hit the ground?

Round your answers to the *nearest hundredth*.

[Only an algebraic or graphic solution will be accepted.]

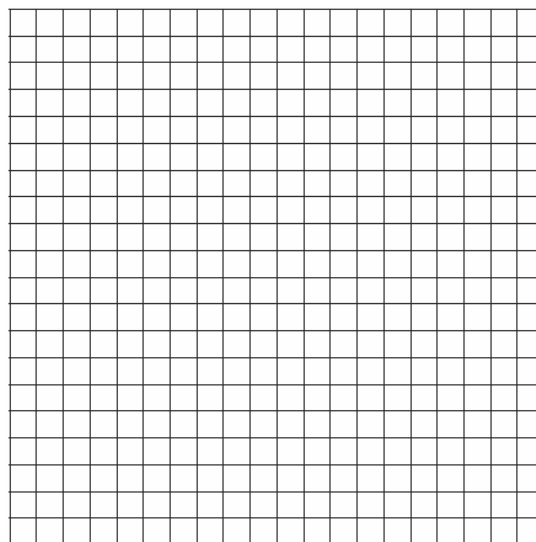


10. 060732b

The path of a rocket fired during a fireworks display is given by the equation

$$s(t) = 64t - 16t^2,$$

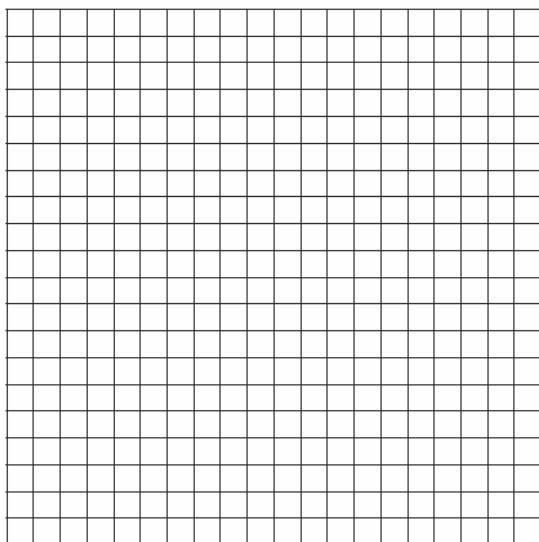
where t is the time, in seconds, and s is the height, in feet. What is the maximum height, in feet, the rocket will reach? In how many seconds will the rocket hit the ground? [The grid is optional.]



NAME: _____

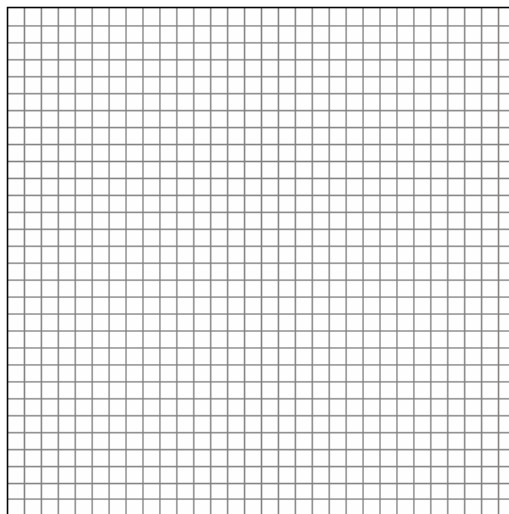
11. 080825b

Each year, the student council at Briarwood High School sponsors a community talent show to raise money. In previous years, the council has discovered that profit from ticket sales, $P(x)$, is a function of the amount charged per ticket, x , in dollars, as modeled by the equation $P(x) = 120x - 12x^2$. What amount should the council charge for a ticket to make the greatest profit? [The use of the grid is optional.]



12. 010834b

The members of the Lincoln High School Prom Committee are trying to raise money for their senior prom. They plan to sell teddy bears. The senior advisor told them that the profit equation for their project is $y = -0.1x^2 + 9x - 50$, where x is the price at which the teddy bears will be sold and y is the profit, in dollars. On the grid below, graph this relationship so that $0 \leq x \leq 90$ and $-50 \leq y \leq 160$. How much profit can the committee expect to make if they sell the teddy bears for \$20 each? What price should they charge for the teddy bears to make the maximum profit possible?



[1] B _____

[2] C _____

[3] A _____

[4] C _____

[5] B _____

[6] C _____

[7] A _____

[8] B _____

[4] Time of maximum height = 2.45, maximum height = 31.39, time when it hit the ground = 4.98, and appropriate algebraic or graphic work is shown. [Answers for time, in seconds, may vary based on method of solution.]

[3] Appropriate algebraic or graphic work is shown, but one computational or graphing error is made.

or [3] The times are found correctly, but the maximum height is incorrect.

[2] The rock's maximum height and the time it takes to reach that height are found correctly, but the time it takes to hit the ground is incorrect.

or [2] The time it takes the rock to hit the ground is found correctly, but the maximum height and the time it takes to reach that height are incorrect.

[1] Time of maximum height = 2.45, maximum height = 31.39, time when it hit the ground = 4.98, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[9] incorrect procedure.

[4] Maximum height = 64 and time = 4, and appropriate work is shown.

[3] Appropriate work is shown, but one computational or graphing error is made.

or [3] The correct time is found, and appropriate work is shown, but the maximum height is not found.

[2] Appropriate work is shown, but two or more computational or graphing errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] The maximum height is found correctly, and appropriate work is shown, but an incorrect value is found for t .

or [2] Appropriate work is shown, but only the time that the maximum height occurs is found, and the quadratic equation

$64t - 16t^2 = 0$ is factored, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.

or [1] Appropriate work is shown, but only the time that the maximum height occurs is found, or the quadratic equation

$64t - 16t^2 = 0$ is factored.

or [1] Maximum height = 64 and time = 4, but no work is shown.

[0] Maximum height = 64 or time = 4, but no work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[10] obviously incorrect procedure.

[2] 5, and appropriate work is shown.

[1] Appropriate work is shown, but one computational or graphing error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 5, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[11] incorrect procedure.

- [6] A correct graph is drawn, 90 and 45, and appropriate work is shown.
- [5] Appropriate work is shown to answer all three parts of the question, but one computational or graphing error is made.
- [4] Appropriate work is shown, but two or more computational or graphing errors are made.
- or [4] A correct graph is drawn, and 90 or 45, and appropriate work is shown.
- [3] Appropriate work is shown, but one conceptual error is made.
- or [3] 90 and 45, and appropriate work is shown, but no graph is drawn.
- or [3] A correct graph is drawn, but no further correct work is shown.
- [2] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.
- [1] 90 or 45, and appropriate work is shown.
- or [1] 90 and 45, but no work is shown and no graph is drawn.
- [0] 90 or 45, but no work is shown.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [12] _____