Pre-Calculus 120A Exam Review

**SHORT RESPONSE: Place your answer for each of the following questions in the box provided.**

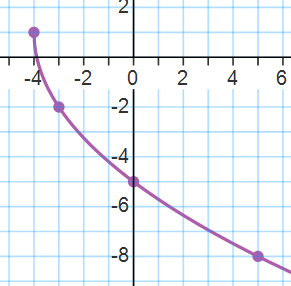
1. The graph of is reflected across the x-axis, stretched   
   vertically by a factor of  and translated 2 units to the right  
   and 4 units up to form the transformed function .  
   Determine the equation of the function.
2. The key point  is on the graph of. Determine  
    the coordinates of its image point under the transformation  
    .
3. The domain of  is. Determine the  
   domain of the transformed function.
4. Which of the following transformations ofproduces a

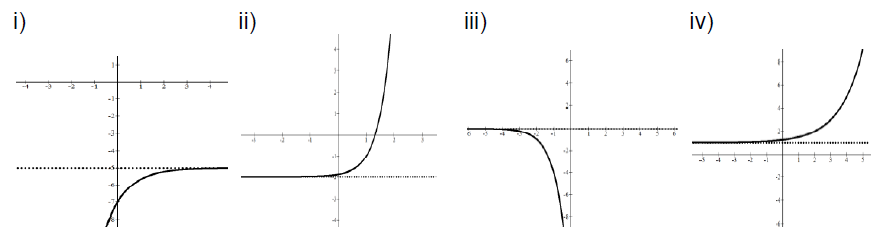
graph that has the same x-intercept as? Assume  is

NOT a poin on .

* 1.  b.  c.  d. 

1. Determine an equation for the following graph.



1. What are the domain and range of the function ?
2. What are the domain and range of the function ?
3. What are the domain and range of the function?
4. Match each function with the corresponding graph.
   1.  b.  c.  d. 
5. Write the expressions  and with the same base.
6. State the equation of the asymptote for.
7. What is the value of  rounded to two decimal places?
8. Solve .
9. Solve .
10. Write  as a single simplified

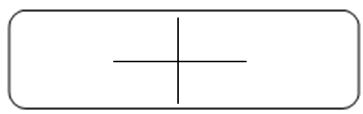
logarithmic expression.

1. Write  in expanded form.
2. State the domain of the function



1. Evaluate the expression .
2. Convert  to radians.
3. Convert  radians to degrees.
4. State one positive angle coterminal with .
5. Express the angles coterminal with  in general form.
6. State one negative angle coterminal with .
7. State the angles coterminal with  in the domain .
8. An arc has a central angle of  in a circle with radius 12.4 m.

State the length of the arc to the nearest tenth of a metre.



1. Sketch  in standard position on the axes provided.
2. Give an angle, in radians rounded to two decimal places, whose

terminal arm contains the point .

1. The point  is located on the terminal arm of  in standard

position. What is the exact value of ?

1. Convert the polar coordinates  to exact rectangular

coordinates.

1. State another pair of polar coordinates for the point .
2. State the approximate value, rounded to four decimal places,

for .

1. Determine a *positive* measure (in degrees) for angle  if

.

1. State the *exact* value for .
2. Determine the missing coordinate for the point  in

quadrant 4 on the unit circle.

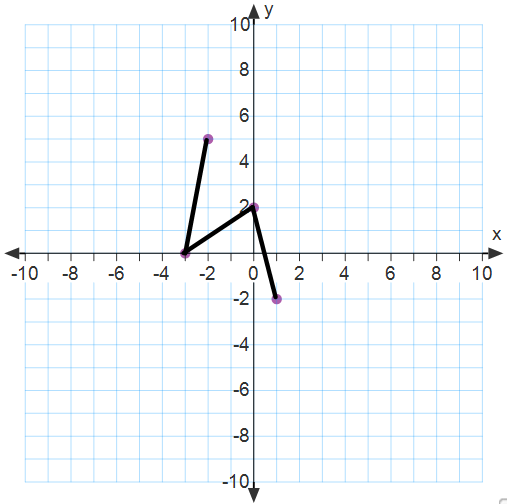
1. A trigonometric function in the form  has

range . State the values of *a* and *k*.

1. State the general solution, in degrees, for .

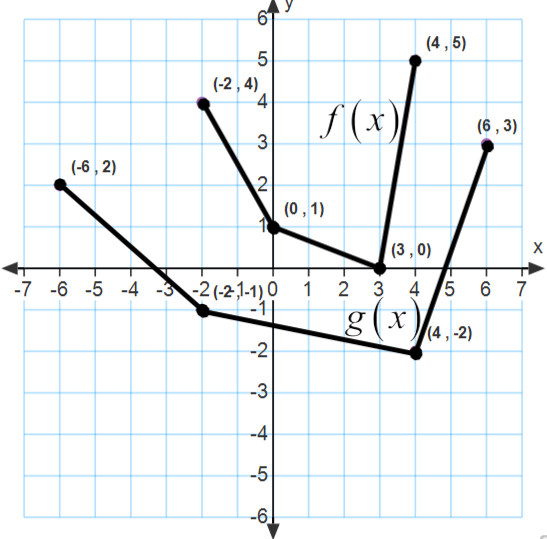
**OPEN RESPONSE:**

1. Given the graph of , sketch the graph of.

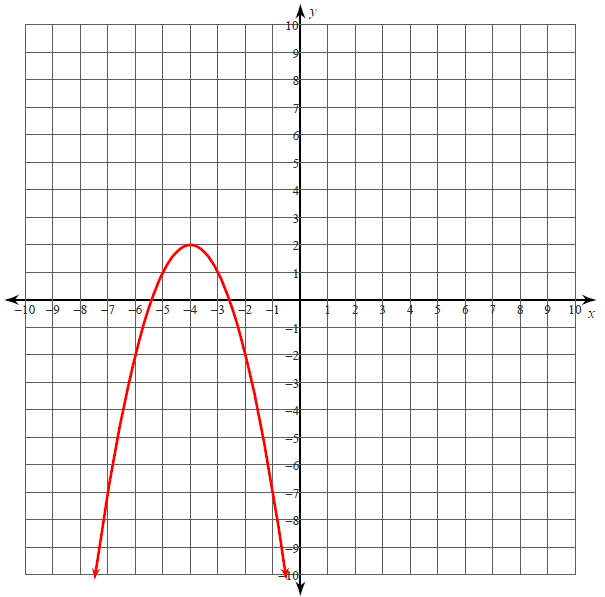
State the domain and range of .

Domain:

Range:



1. State the equation of  as a transformation of in the form .

1. The graph of is illustrated to the right.

a. Draw the inverse of f(x) on the same grid.

b. Write the equation of the inverse.

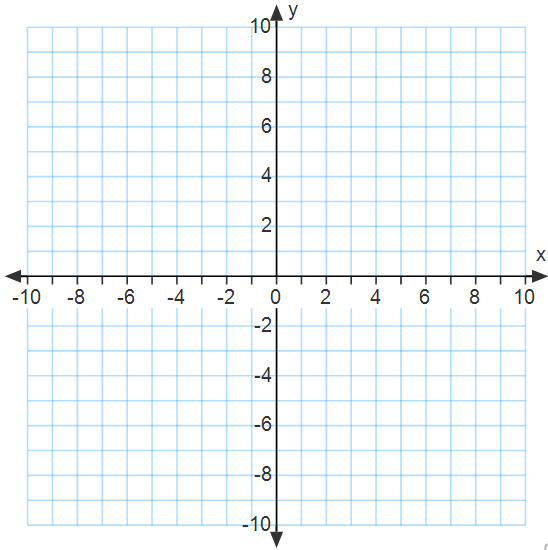
c. State the domain and range of the function and its inverse.

Domain of f(x): Range of f(x):

Domain of inverse of f(x): Range of inverse of f(x):

d. How would you restrict the domain of the original function so that the inverse is a function?

1. Sketch the graph of . Determine the x-intercept, y-intercept, domain and range.



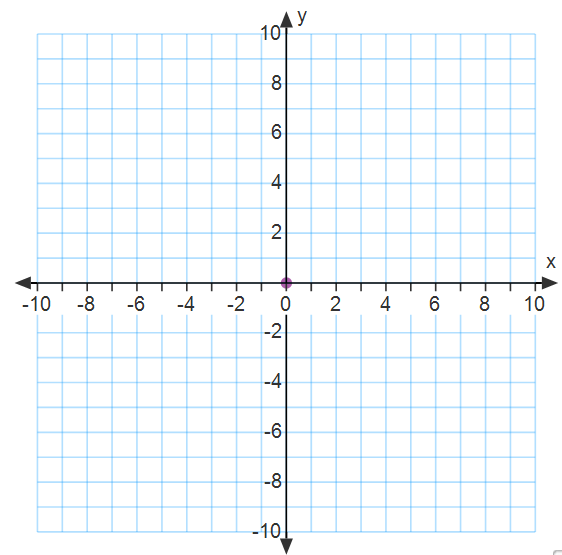
x-intercept:

y-intercept:

Domain:

Range:

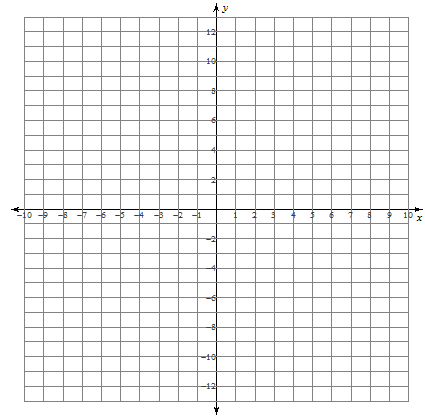
1. Solve the following radical equation *graphically* and *algebraically*. Be sure to check for extraneous solutions.





1. Graph the exponential function . Identify the domain, range, equation of the asymptote,

x-intercept, and y-intercept.



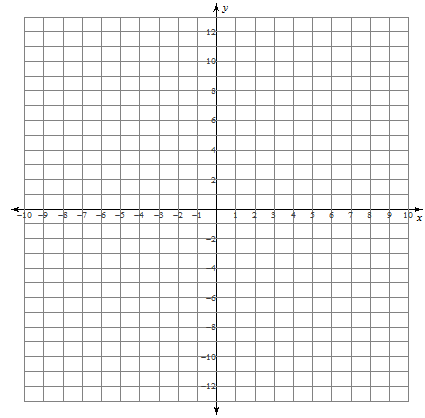
Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation of the asymptote : \_\_\_\_\_\_\_\_\_\_\_

x-intercept: \_\_\_\_\_\_\_\_\_\_\_

y-intercept : \_\_\_\_\_\_\_\_\_\_\_

1. Graph the logarithmic function . Identify the domain, range, equation of the asymptote, x-intercept, and y-intercept.

Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation of the asymptote : \_\_\_\_\_\_\_\_\_\_\_

x-intercept: \_\_\_\_\_\_\_\_\_\_\_

y-intercept : \_\_\_\_\_\_\_\_\_\_

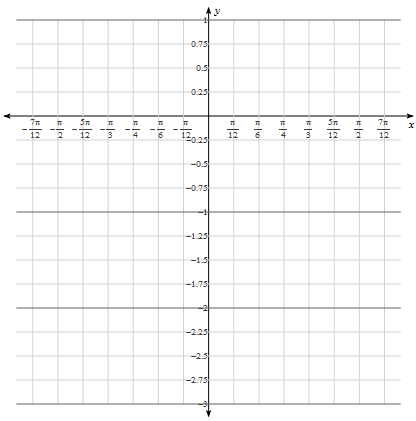
1. A rabbit population quadruples every three years. There were 250 rabbits to start with.
   1. How many rabbits are there after seven years?
   2. Calculate the number of years it will take for the population to reach 16 000.
2. In a nuclear disaster at Chernobyl in April 1986, approximately 12 600 kg of radioactive iodine-131 was released into the atmosphere. Iodine-131 is known to decay by half every 8.04 days.
3. Determine the approximate mass of iodine-131 remaining after 30 days.
4. When was there 126 kg remaining?
5. Simplify and evaluate the following expression:



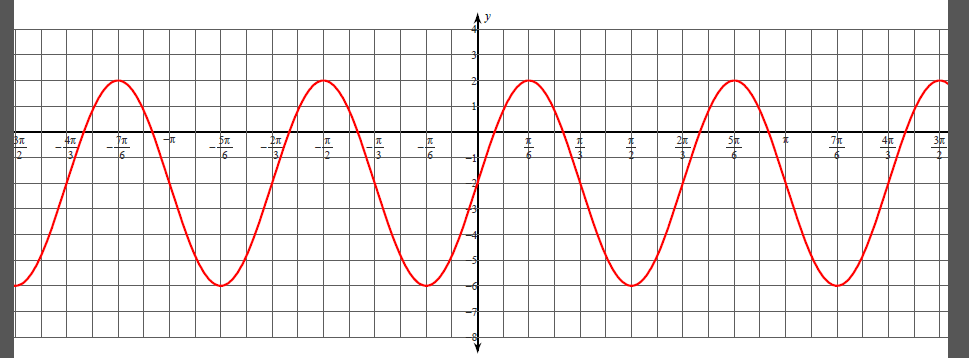
1. Solve the following equations algebraically.
   1. 

* 1. 
  2. 
  3. 
  4. 
  5. 
  6. 
  7. 

1. A large pizza has a diameter of 40 centimeters. A piece of pizza has a central angle of . How long is its crust? An extra-large pizza has a diameter of 46 centimeters. What is the central angle of a piece with the same length of crust as the piece in the large pizza?
2. Sketch the function  on the grid provided, then state its characteristics.

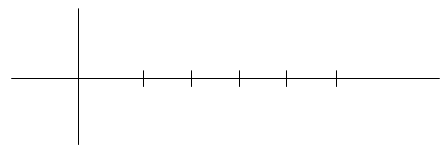


Equation of Sinusoidal Axis: Amplitude: Period: Domain: Range:

1. Determine two possible equations (one sine, one cosine) for the sinusoidal function shown below.

Sine equation:Cosine equation:

1. Solve the following equations algebraically for the given interval.
2. 
3. 
4. 
5. 
6. Determine the general solution, in radians, for each equation.
   1. 
   2. 
   3. 
   4. 
7. Mr. Murdock is distracted by shiny objects, like the hands on a clock. He decides to watch the second hand rotate around. The second hand is 8 cm long and its tip is 2 m from the floor when it’s at the top of the clock. Mr. Murdock started watching the clock when the second hand was at the bottom.
   1. Sketch a graph to represent this situation.



* 1. Determine an equation to represent this situation.
  2. Determine the height of the second hand after 20 seconds .
  3. When will the height be 193 cm? Determine all possible answers.

1. Determine the non-permissible values, in radians, for each expression.
   1.  b. 
2. Simplify the following trigonometric expressions.
   1.  b.  c. 
3. Verify that the identity  is true for  and for .
4. Use a sum or difference identity to find the exact value of each expression.
   1.  b. 
5. Prove that each identity holds for all permissible values of x.
   1. 
   2. 
   3. 
   4. 
   5. 
   6. 

Pre-Calculus 12A Exam Review Solutions

**SHORT RESPONSE:**

1. 
2. 
3. 
4. b. 
5. 
6. 

Domain:  Range: 

1. 

Domain:  Range: 

1. 

Domain:  Range: 

1. i) D ii) A iii) C iv) B



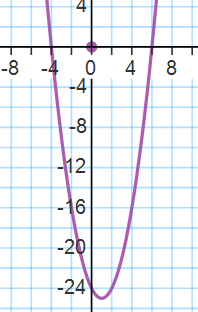
1. Vertical asymptote: 
2. 





1. 
2. 





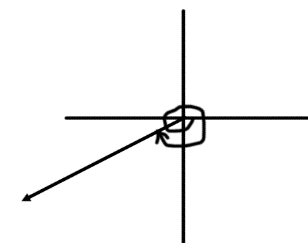


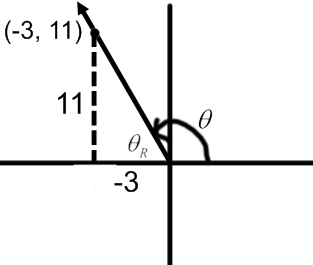


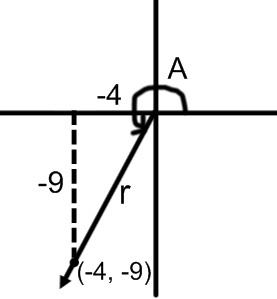
1. 
2. 
3. 
4. 
5. 



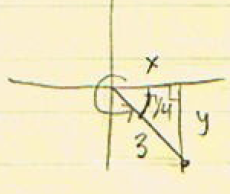






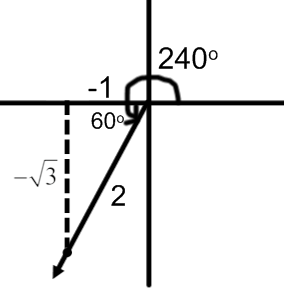
1. 

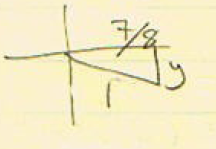
  

1. 





1. 

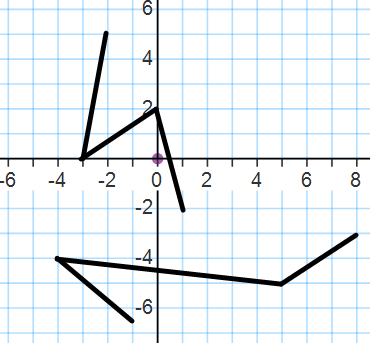
1. Quadrant IV, so y<0







**OPEN RESPONSE:**

1. 



Domain:  Range: 

1. Width of , Width of , so horizontal stretch of 2

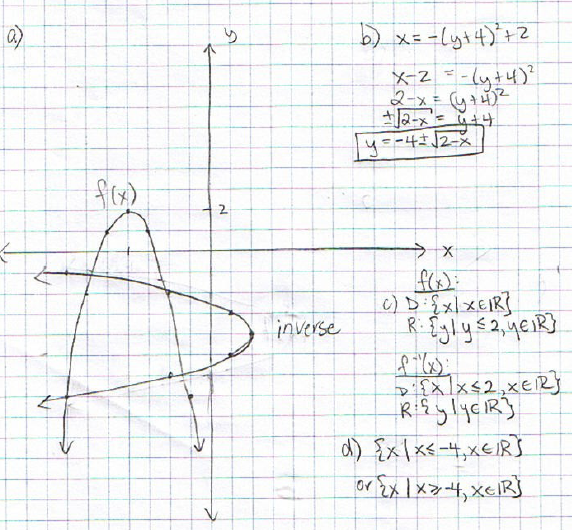
Height of , Height of , so no vertical stretch

No reflections

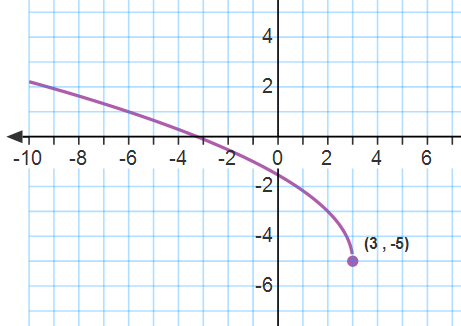
, so 

, so 

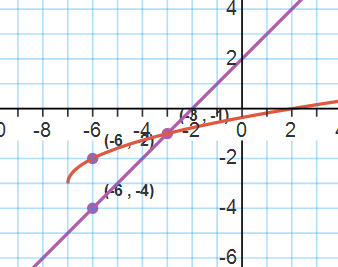
Thus, 

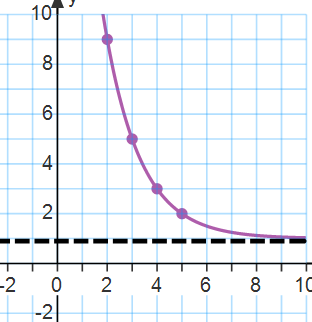


x-intercept: y-intercept: Domain:  Range: 



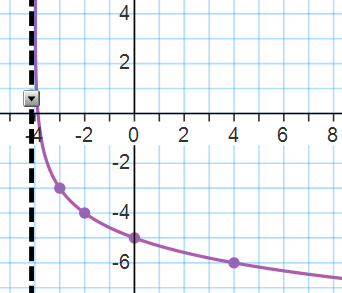
 



1. 

1. 

* 1.  b. 
  2.  b. 





a.  b.  c. 

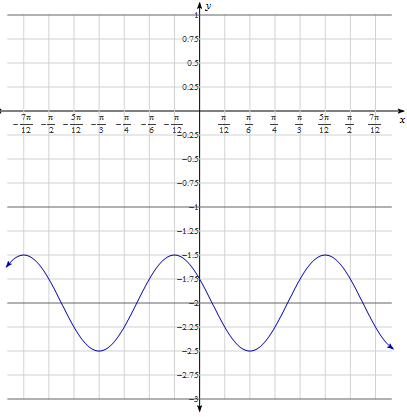
d.  e.  f. 

g. h. 

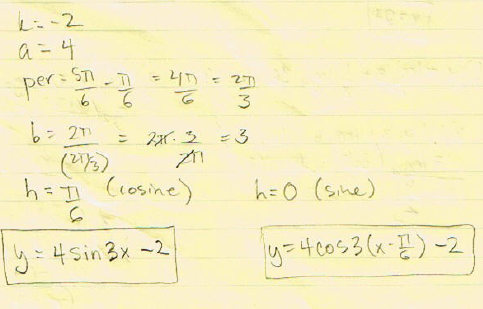
1.  crust: 

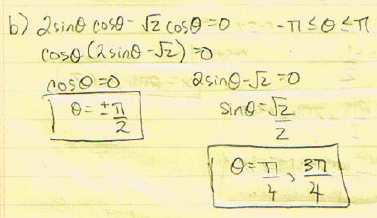
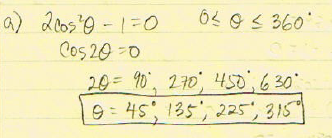
 Central angle: 

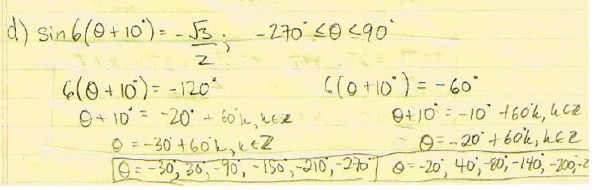
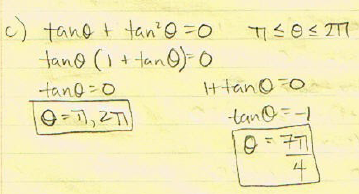
1. 



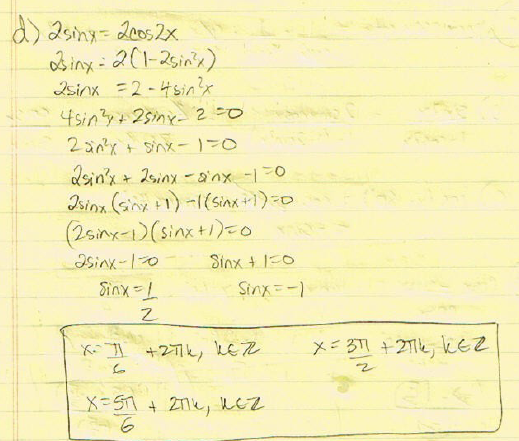
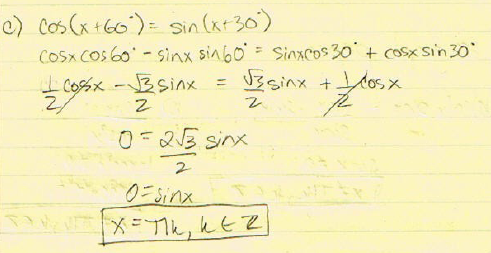
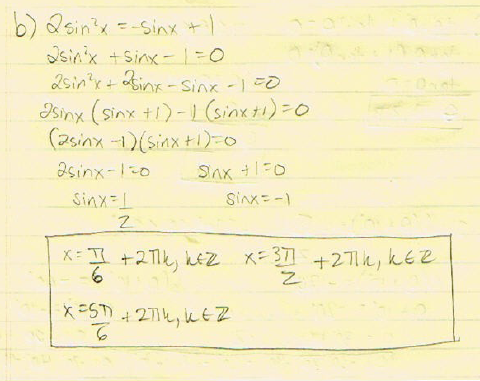
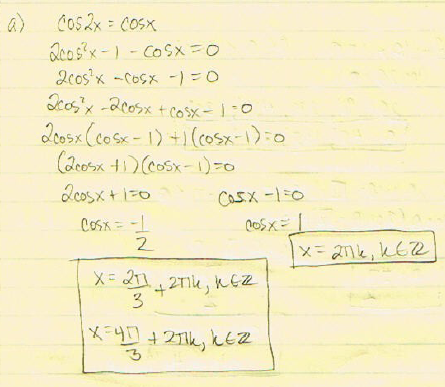
Equation of Sinusoidal Axis: y = –2 Amplitude: 0.5 Period:  Domain:  Range: 

1. 
2. A

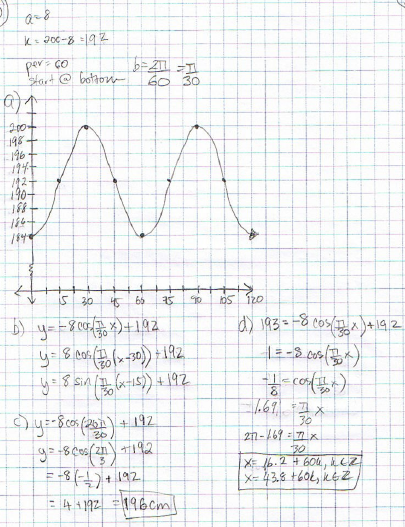




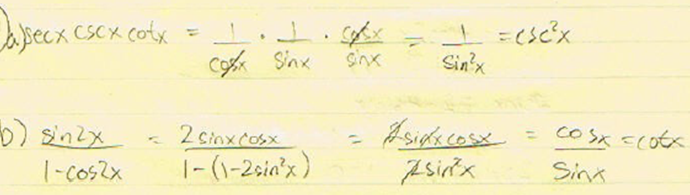
1. A



1. A

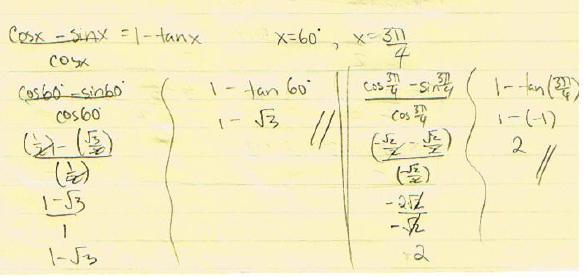


1.  
2. A

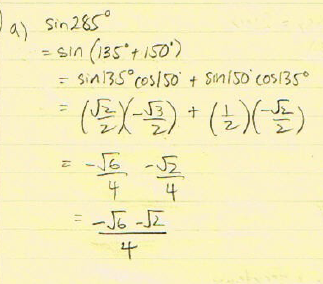
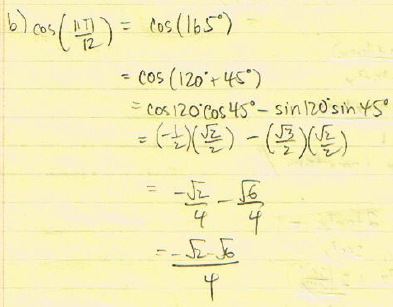




1. A



1. A

1. **Please note: There are correct solutions other than the ones shown.**







