**Radical Functions Review**

* There is only one curriculum outcome in radicals.
* On the past two diploma exams there has been **1 question** on the diploma dealing with radicals.



1. a. Explain how to transform each of graphs of  to obtain each function

b. Graph each function and identify:

i) Domain and Range in interval notation

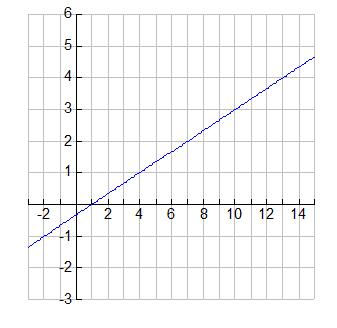
ii) the x –intercept

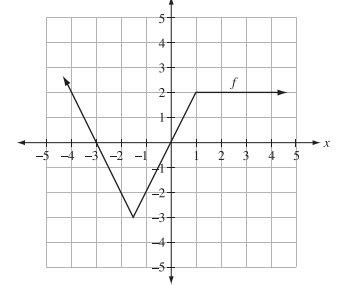
1. For each state the coordinates of any invariant points when is transformed into .

a.  b. 

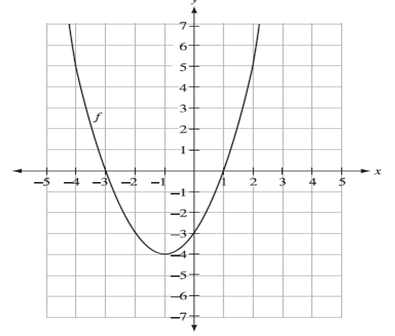
1. Use the graph of below to sketch the graph . State the domain, range and intercepts of the image function. State the coordinates of any invariant points.



a.



b.

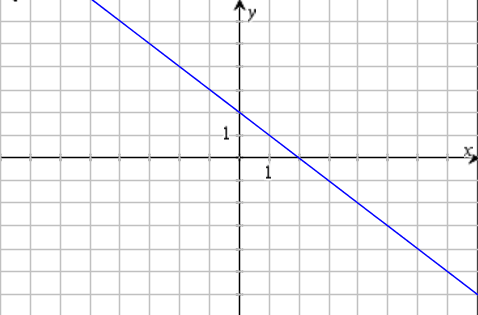


c.

Practice Questions

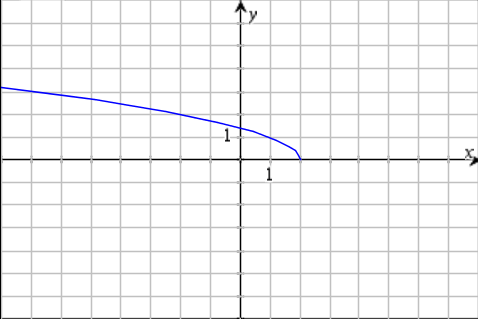
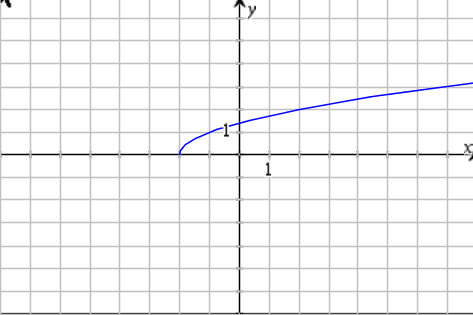
Multiple-Choice

**1.** The graph of the function  is shown below.

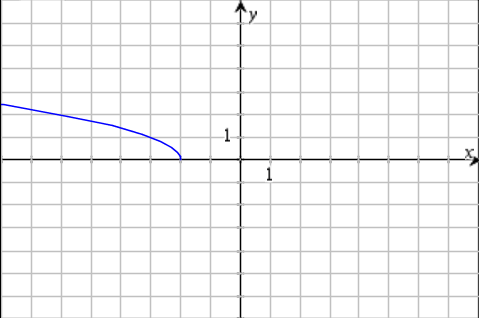


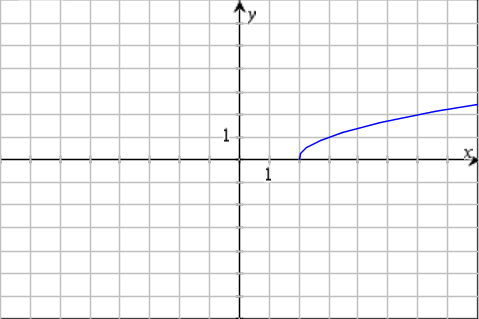
The correct graph of  is

**A.** **B.**



**C.** **D.**





**2.** Compared to the graph of , the graph of  will be reflected in the

**A.**  x-axis and translated 3 units to the right and 5 units down.

**B.** y-axis and translated 3 units to the right and 5 units down.

**C.** x-axis and translated 3 units to the left and 5 units down.

**D.** y-axis and translated 3 units to the left and 5 units down.

**3.** The restriction on the variable for the equation  are

**A.** 

**B.** 

**C.** 

**D.** 

**4.** The equation  has

**A.** 1 solution

**B.** 2 solutions

**C.** no solution

**D.** infinitely many solutions

**5.** If  and  are all equal to 2, the value of  in the equation  is

**A.** 

**B.** 

**C.** 

**D.** 

**6.** The roots of a rational equation correspond to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the graph of the related rational function.

**A.** y-intercepts

**B.** x-intercepts

**C.** vertical asymptotes

**D.** horizontal asymptotes

Numeric Response:

**1.** The radical function  has an - intercept at  . If the graph of the function is stretched horizontally by a factor  about the - axis, the new - intercept

will be \_\_\_\_\_\_\_\_\_\_\_\_.

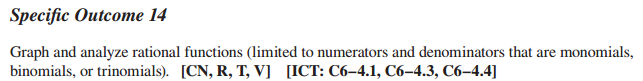
**2.** The point  is on the graph of the function . The value of  is

\_\_\_\_\_\_\_\_\_\_\_\_\_.

**3.** The solution to the equation , rounded to the nearest tenth, is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Rational Functions Review**

* There is only one curriculum outcome in rationals.
* On the past two diploma exams there have been **2 questions** on the diploma dealing with rational functions.



1. Graph each function and identify:

i) Domain and Range in interval notation

ii) The equation of any vertical and horizontal asymptotes

1.  b. 





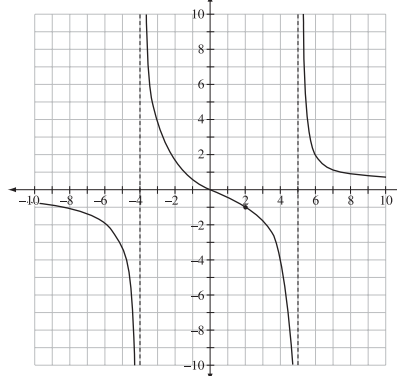
c.  d. 



2. Determine the points of discontinuity for each and state the domain and range.

1.  b.  c. 

3. The graph of the function below can be expressed in the form 



Determine the values of a, b, and c

Practice Questions

Multiple-Choice

**1.** The roots of a rational equation correspond to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the graph of the related rational function.

**A.** y-intercepts

**B.** x-intercepts

**C.** vertical asymptotes

**D.** horizontal asymptotes

**2.** Determine the vertical asymptote of 

**A.** 

**B.** 

**C.** 

**D.** There is no vertical asymptote.

**3.** The x-intercepts of 

**A.** 

**B.** 

**C.** 

**D.** 

**4.** The restriction on the variable of the rational function  are

**A.** 

**B.** 

**C.** 

**D.** 

Numeric Response:

**1.** The function  has an domain of  and a range of .

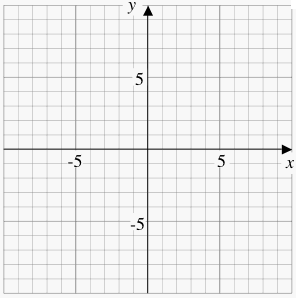
The value of  is \_\_\_\_\_\_\_\_\_\_\_\_\_.

**2.** The equation  has \_\_\_\_\_\_\_\_\_\_\_\_\_ roots.

Written Response

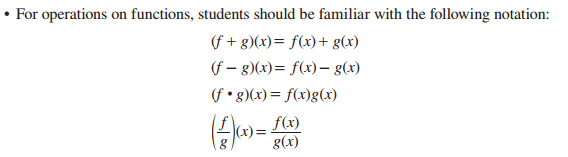
**1.** **a)** Sketch the graph of the function .

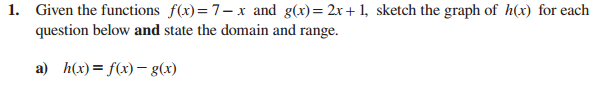
**b)** Identify the domain, range, and asymptotes of the function.



**Composition of Functions Review**

* There is only one curriculum outcome in composition of functions.
* On the past two diploma exams there have been **2 -3 questions** on the diploma dealing with the composition of functions.







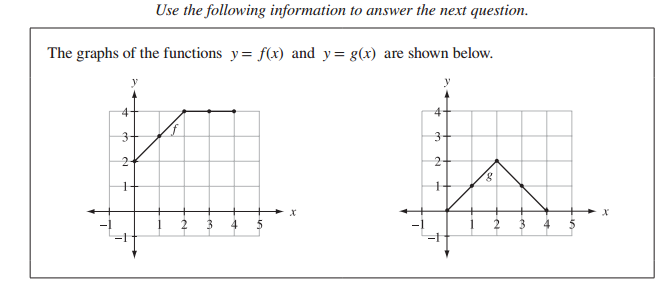










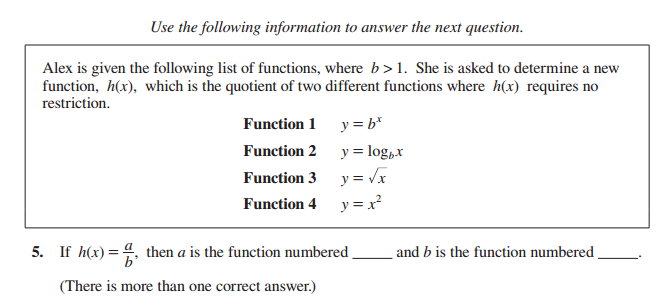


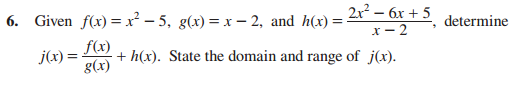
**3.** Sketch the graphs of











Practice Questions

Multiple-Choice

**1.**  and  What is ?

**A.** 

**B.** 

**C.** 

**D.** 

**2.** If  , and if  , which of these statements could be correct?

**A.**  , and 

**B.** , and 

**C.**  and 

**D.**  and 

**3.** Two functions are given.  

Some operations involving the given functions are as follows:

**I.**  **II.**  **III.**  **IV.** 

Which of the functions  have domain restrictions?

**A. II** and **IV** only

**B. II** and **III** only

**C. I, II,** and **IV** only

**D. I, II, III**, and **IV**

**4.** The function  undergoes an operation that results in the new function

. The operation on  to give  was to,

**A.** square .

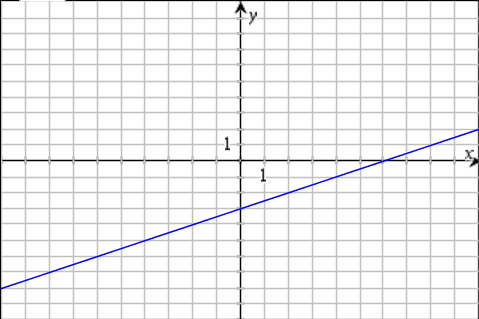
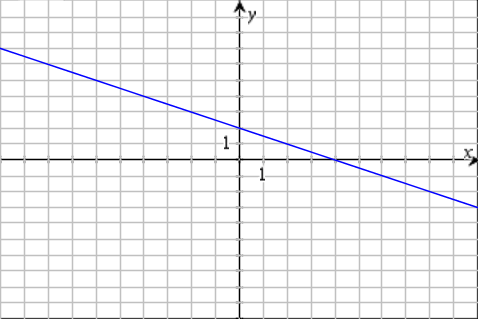
**B.** add  to itself.

**C.** take the square root of .

**D.** multiply  by its conjugate.

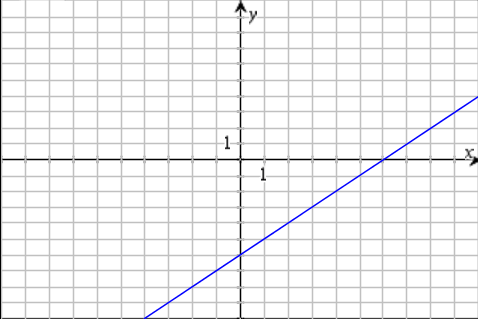
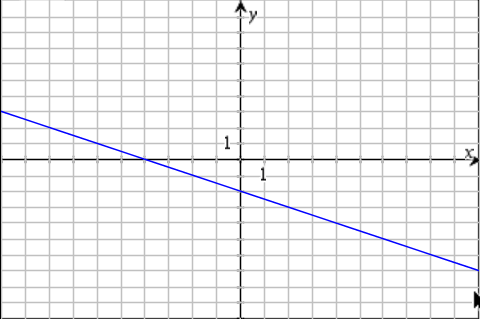
**5.** Two graphs of functions  and  are shown.

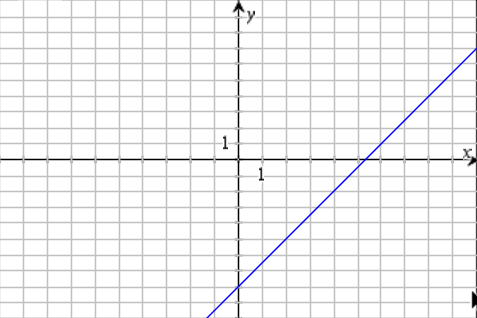
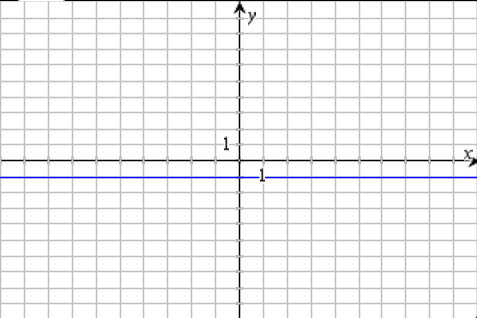
 

The graph of  would be

**A.** **B.**

**C. D.**

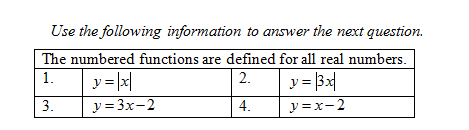
Numerical Response

**1.** If  and  , the value of  equals \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Use the table to evaluate each expression.

|  |  |  |
| --- | --- | --- |
| ***x*** | ***f* (*x*)** | ***g*(*x*)** |
| 1 | 3 | 6 |
| 2 | 1 | 3 |
| 3 | 4 | 2 |
| 4 | 2 | 1 |
| 5 | 2 | 2 |
| 6 | 5 | 3 |



3. The function  is a composite function of functions *f* and *g* such that.

If the simplified form of is expressed as , then

is represented by function number \_\_\_\_

is represented by function number \_\_\_\_

Written Response

**1.** Given *f* (*x*) = *x*2 - 1, *g*(*x*) =, state the domain and range of each of the

following.

a) *y* = ( *f* + *g*)(*x*) b)  c) 

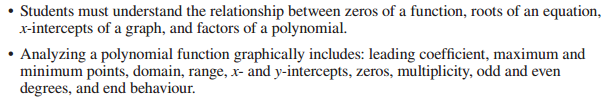
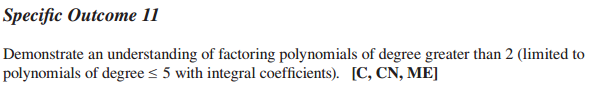
**2.** Consider *f* (*x*) = *x*2 - 7 and *g*(*x*) =4*x* + 5.

a) *h*(*x*) = *g* (*x*) - *f*(*x*), find *h*( - 2). b) find *m*( -1).

c)*p*(*x*) = *g*(f(*x*)), find *p*(1). d)  find *z*( -2).

**Polynomial Functions Review**

* There is only two curriculum outcome in polynomial functions.
* On the past two diploma exams there have been **4 questions** on the diploma dealing with the polynomial functions.



1. Express the following polynomials in factored form.

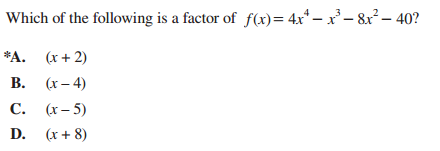




1. Determine the roots of the equation . Leave answers as exact values.



1. Which of the above functions represents a polynomial function? Explain why or why not?

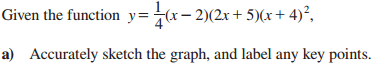


4.



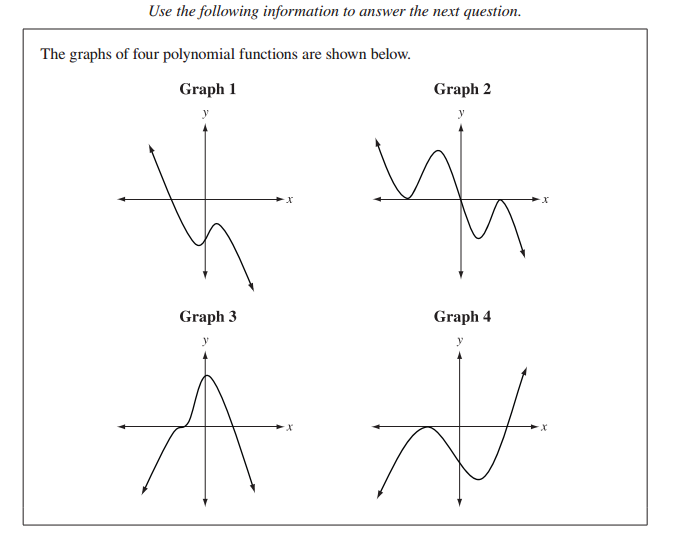
5.

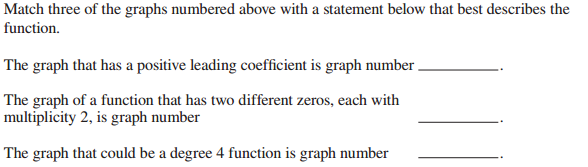
6.

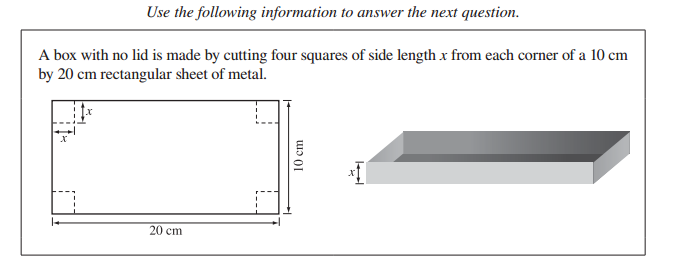


7.

8.



9.



10. Using the information above, follow the directions below.

a) Find an expression that represents the volume of the box.

b) Sketch the graph of the function and state the restrictions.

c) Find the value of x, to the nearest hundredth of a centimeter, that gives the maximum volume.

d) What is the maximum volume of the box, to the nearest cubic centimeter?

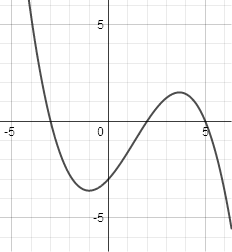
Practice Questions

1. Express the following polynomials in factored form.
   1.  b)
2. What are the zeros of the function ?
3. What is the remainder when  is divided by ?
4. When  is divided by , the remainder is 0. What is the value of *p*?
5. Boxes for candies are to be constructed from cardboard sheets that measure 36X20 cm. Each box is formed a sheet along the dotted lines as shown. (Remember the base is half the length of the sheet.



* 1. Write an equation, in factored form, of the polynomial function that represents the volume of the box.
  2. Determine the possible values of *x* if the volume is to be 512 . Round your answer to the nearest tenth.
  3. Determine the maximum volume of the box, to the nearest cubic centimeter.

1. The graph of  is shown below.



Write the equation of the polynomial function in factored form.

1. The graph of the polynomial function  is shown below.



* 1. What is the minimum possible degree for the polynomial function above? Explain   
     how you know.
  2. Determine an equation of the function in factored form.

1. Determine the equation with the least degree for each polynomial function.
   1. x-intercepts of -1, -2, and 4 and the y-intercept is 32
   2. quartic function with zeros 2 (multiplicity 3) and -5 (multiplicity 1) and y-intercept 30.
2. Given the function ,
   1. Accurately sketch the graph, and label any key points (*x*-intercepts, *y*-intercepts, maximum, minimum).
   2. State the domain and range.