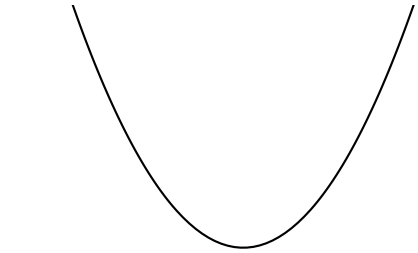
Concept MCQs

1 ID 17 Finding the Discriminant

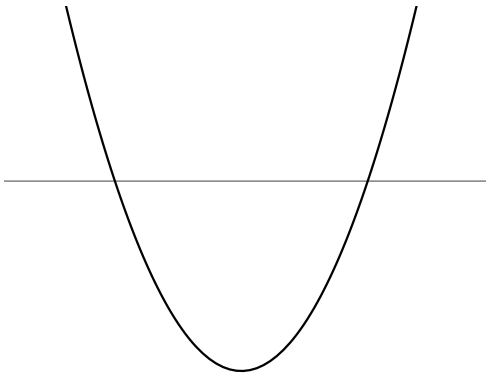
1. A quadratic function is described by $y = ax^2 + bx + c$ Which of the graphs below corresponds to

$$b^2 - 4ac < 0$$

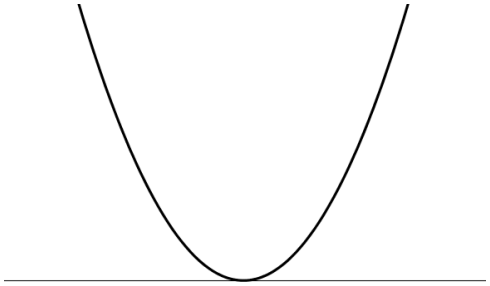


(a)

(b) .



(c) .

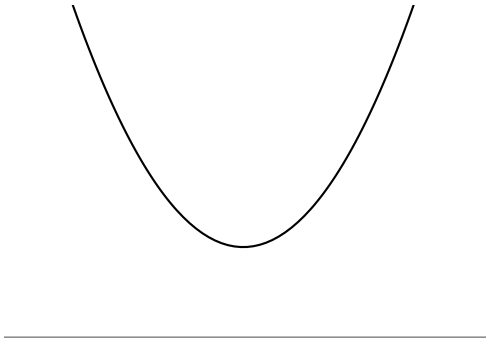


(d) I don't know yet.

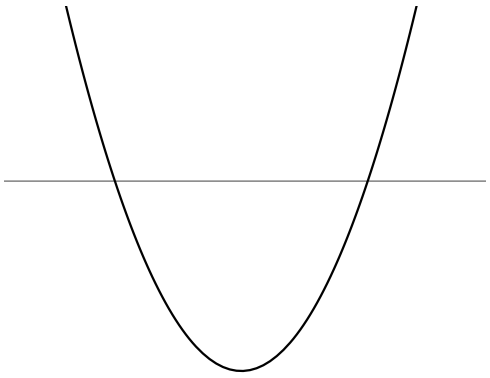
2. Which of the graphs below corresponds to the function:

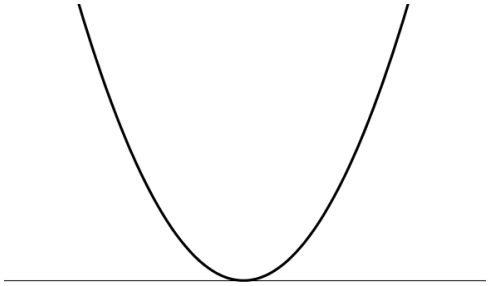
$$y = x^2 + 6x + 9$$

(a) .



(b) .





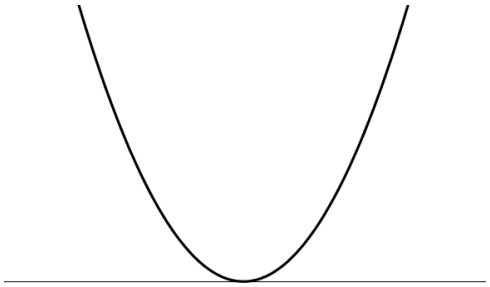
(c)

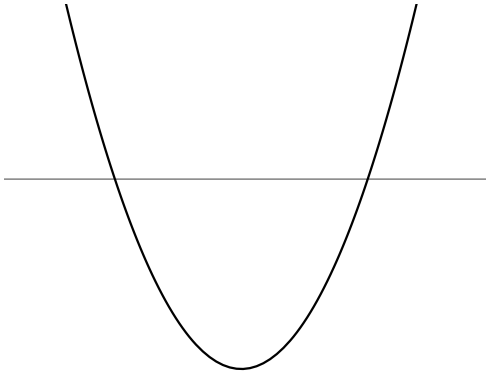
(d) I don't know yet.

3. Which of the graphs below corresponds to the function:

$$y = x^2 + 6x + 1$$

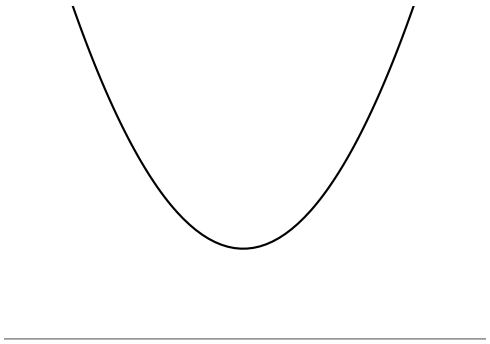
(a) .





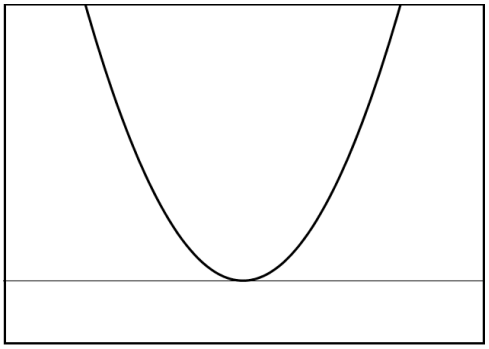
(b)

(c) .



(d) I don't know yet.

4. Which of the quadratic functions listed below is best described by the following graph:



(a) $y = x^2 + 5x + 4$

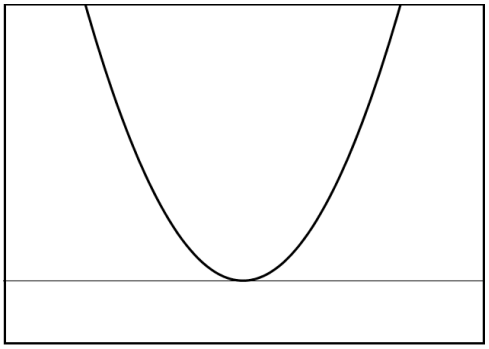
(b) $y = x^2 + 10x + 25$

(c) $y = x^2 + x + 10$

(d) I don't know yet

2 ID 18 Using the discriminant to find unknown coefficients

1. Below is the graph of the function $y = x^2 + bx + 25$.
   What is the value of b ?



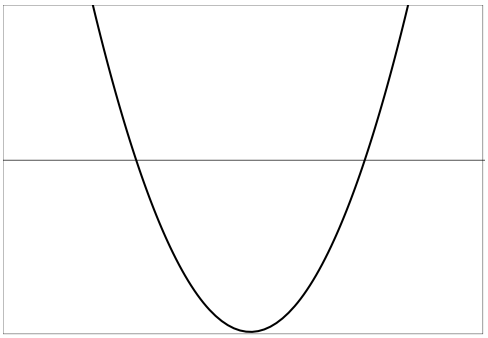
   (a) $b = 5$

   (b) $b = 10$

   (c) $b = 25$

   (d) I don't know yet.

2. Below is the graph of the function $y = x^2 + 6x + c$
   What range of values describes c ?



   (a) $36 - c > 0$

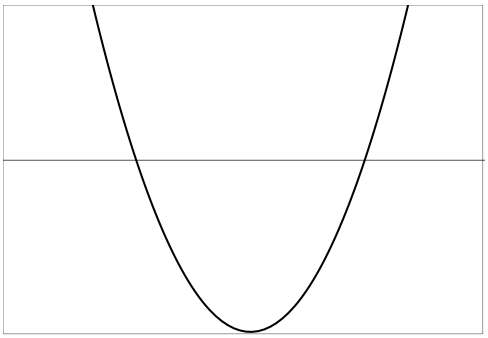
   (b) $c - 36 > 0$

   (c) $36 - 4c > 0$

   (d) $36 - 4c < 0$

   (e) I don't know yet.

3. Below is a graph of the function $y = x^2 + (k+1)x + k$
   Which of the inequalities outlined below best describes the function?



   (a) $k^2 - 4k - 4 > 0$
   (b) $(k+1)^2 - 4k > 0$
   (c) $(k+1)^2 - 4k < 0$
   (d) $k^2 - 4k - 4 < 0$
   (e) I don't know yet.

3 ID 23 Index Equations , $x \in Q$

1. Solve for x:

$$2^x = \sqrt{2}$$

   (a) $x = 2$
   (b) $x = \frac{1}{2}$
   (c) $x = -1$
   (d) $x = \frac{\sqrt{2}}{2}$
   (e) I don't know yet

2. Solve for x:

$$3^x = 9$$

   (a) $x = 2$
   (b) $x = 3$
   (c) $x = \frac{1}{2}$
   (d) I don't know yet.

3. Solve for x:

$$25^x = 5$$

   (a) $x = 2$
   (b) $x = 5$

(c) $x = \frac{1}{5}$

(d) $x = \frac{1}{2}$

(e) I don't know yet.

4. Solve for x:

$$2^x = \frac{1}{2}$$

(a) $x = -1$

(b) $x = \frac{1}{4}$

(c) $x = 2$

(d) $x = 4$

(e) I don't know yet.

5. Solve for x:

$$3^x = \frac{1}{9}$$

(a) $x = 2$

(b) $x = -2$

(c) $x = \frac{1}{3}$

(d) $x = 3$

(e) I don't know yet.

4 ID 7 Long Division in Algebra

1. What is $(x^2 + 5x + 4) \div (x + 4)$

(a) $(x - 4)$

(b) $(x + 5)$

(c) $(x + 1)$

(d) $(x - 1)$

(e) I don't know yet.

2. What is $(3x^2 + x - 2) \div (x - 1)$

(a) $(x - 2)$

(b) $(3x + 2)$

(c) $(x + 3)$

(d) $(x - 3)$

(e) I don't know yet.

3. Which of the following expressions is a factor of:

$$x^3 + 4x^2 + x - 6$$

(a) $(3x - 1)$

(b) $(3x + 2)$

(c) $(x + 2)$

(d) $(4x - 6)$

(e) I don't know

4. Which of the following expressions is a factor of:

$$2x^3 + 3x^2 - 3x - 2$$

(a) $(2x + 1)$

(b) $(3x - 1)$

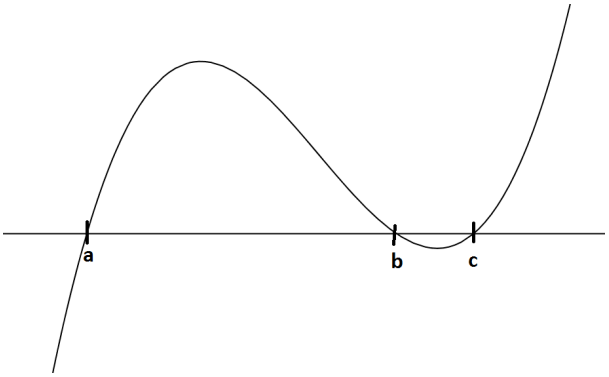
(c) $(3x + 1)$

(d) $(4x + 1)$

(e) I don't know yet.

5 ID 19 Solving Cubic Equations

1. $(x - 2), (x + 3)$ and $(x - 1)$ are factors of the expression $x^3 - 7x + 6$. What are the values of a, b and c, in the graph of $y = x^3 - 7x + 6$ below?



(a) $a = -3, b = 1, c = 2$

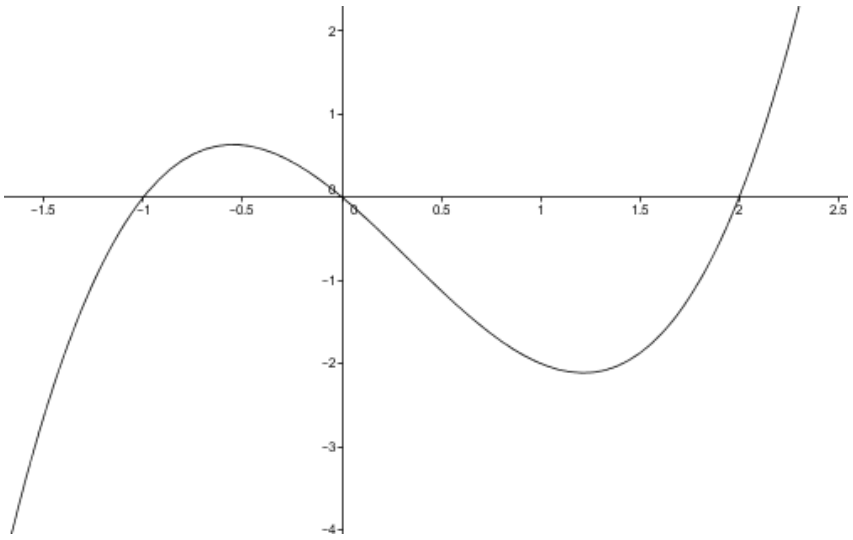
(b) $a = -2, b = -1, c = 3$

(c) $a = 2, b = 1, c = -3$

(d) $a = 3, b = -1, c = -2$

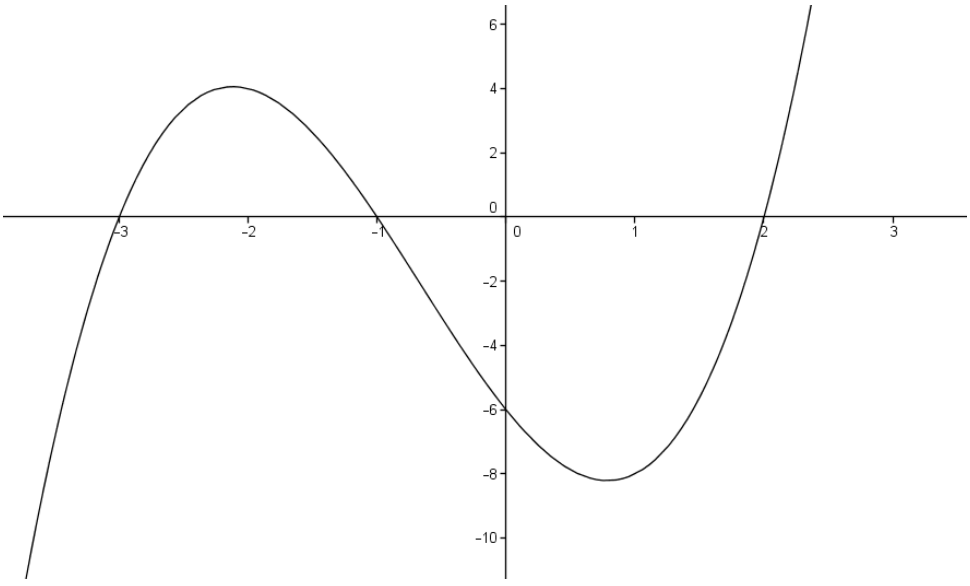
(e) I don't know yet.

2. The function $y = x^3 - x^2 - 2x$ is shown in the graph below. What are the factors of $x^3 - x^2 - 2x$?



(a) $(x-1)(x+2)$
(b) $x(x-1)(x+2)$
(c) $x(x+1)(x-2)$
(d) $(x+1)(x-2)$
(e) I don't know yet.

3. The function $y = x^3 + 2x^2 - 5x - 6$ is shown in the graph. What are the factors of $y = x^3 + 2x^2 - 5x - 6$?



(a) $(x+3), (x+1), (x-2)$
(b) $(x-3), (x-1), (x+2)$
(c) $(3x-1), (x-1), (2x+1)$
(d) I don't know yet.

6 ID16 Surd Equations

1. Solve for x

$$\sqrt{x+3} = 2$$

   (a) $x = 1$

   (b) $x = -1$

   (c) $x = 5$

   (d) $x = -5$

   (e) I don't know

2. What is the appropriate next step in solving the following equation?

$$3\sqrt{x} = x + 2$$

   (a) $3x = x^2 + 4$

   (b) $9x = x^2 + 4$

   (c) $3x = x^2 + 4x + 4$

   (d) $9x = x^2 + 4x + 4$

   (e) I don't know yet

7 ID 21 Cubic Equations Unknown Coefficients using roots

1. $(x-1)$ is a factor of $x^3 - 6x^2 + 11x + k$
   What is the value of k?

   (a) $k = 5$

   (b) $k = 6$

   (c) $k = -5$

   (d) $k = -6$

   (e) I don't know yet.

2. $(x+1)$ is a factor of $x^3 + kx^2 + x + 6$
   What is the value ok k

   (a) $k = -4$

   (b) $k = 1$

   (c) $k = 4$

   (d) $k = -1$

   (e) I don't know yet.

3. Which of the statements below is true considering $(x+1)$ is a factor of x^3+ax^2+bx-6
   (a) $a-b-7=0$
   (b) $a+b-7=0$
   (c) $a+b-5=0$
   (d) I don't know

8 ID 30 Simultaneous Linear equations Two Variables

1. Which of the options below is the correct solution to the following simultaneous equations?

$$x+y=3$$
$$x-y=-1$$

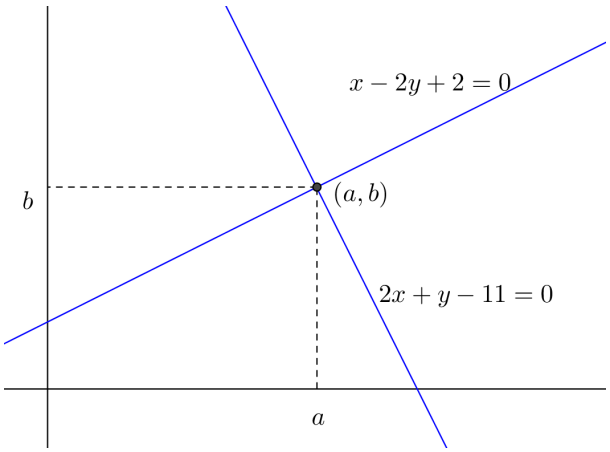
   (a) $x=1$ $y=2$
   (b) $x=3$ $y=0$
   (c) $x=2$ $y=1$
   (d) $x=-3$ $y=-2$
   (e) I don't know yet.

2. Which of the options below is the correct solution to the following simultaneous equation:

$$3x+y=7$$
$$2x-y=8$$

   (a) $x=2$ $y=1$
   (b) $x=-1$ $y=4$
   (c) $x=3$ $y=-2$
   (d) $x=5$ $y=2$
   (e) I don't know yet.

3. The lines $x - 2y + 2 = 0$ and $2x + y - 11 = 0$ intersect at the point (a, b) [see graph]. What are the values of a and b?



   (a) $a = 3$ $b = 4$
   (b) $a = 4$ $b = 3$
   (c) $a = 2$ $b = 1$
   (d) $a = 5$ $b = 1$
   (e) I don't know yet

9 ID 9 Manipulation of Formulae

1. If $3x = 2z - y$, express x in terms of y and z.
   (a) $x = 2z - y - 3$
   (b) $x = \frac{2z-y}{3}$
   (c) $x = \frac{2z}{3} - y$
   (d) $y = 2z - 3x$
   (e) I don't know yet

2. If $az - bz = 3ab$, express z in terms of a and b.
   (a) $z = \frac{3ab}{a-b}$
   (b) $z = \frac{3ab+bz}{a}$
   (c) $z = 3ab + b - a$
   (d) I don't know yet

3. If $3x = 4z + bx$, express x in terms of z and b.
   (a) $x = \frac{4z+bx}{3}$
   (b) $x = 4z + bx - 3$
   (c) $x = 4z + b - 3$
   (d) $x = \frac{4z}{3-b}$
   (e) I don't know yet