Math 521B

Selected Response

Item Bank

Course: Math 521B Outcome: AN3 Level: 2 Item #: 2015-63-AN3-2

Which of the following equations has no solution?

Ⓐ $-8\sqrt{4+x}+5=-3$

Ⓑ $2\sqrt{x-5}-6=-2$

Ⓒ $6+2\sqrt{x-8}=4$

Ⓓ $2-3\sqrt{x+4}=-7$

Course: Math 521B Outcome: AN3 Level: 2 Item #: 2015-64-AN3-2

Which of the following equations has no solution?

Ⓐ $\sqrt{2x+1}-9=-2$

Ⓑ $-\sqrt{2x+1}+9=-2$

Ⓒ $\sqrt{2x+1}+9=2$

Ⓓ $9-\sqrt{2x+1}=2$

Course: Math 521B Outcome: AN4 Level: 1 Item #: 2015-61-AN4-1

Identify the non-permissable values for the following ration expression:

$$\frac{x-2}{x^2-5x+6}$$

Ⓐ $x \neq 2,3$

Ⓑ $x \neq 3$

Ⓒ $x \neq 0,2,3$

Ⓓ $x \neq -3,-2$

Course: Math 521B Outcome: AN4 Level: 1 Item #: 2015-62-AN4-1

Identify the non-permissable values for the following ration expression:

$$\frac{x-3}{2x^2-6x}$$

Ⓐ $x \neq 0, -3$

Ⓑ $x \neq 0, 3$

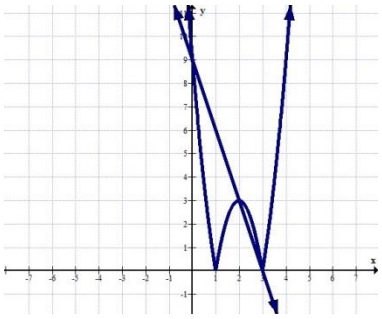
Ⓒ $x \neq 0$

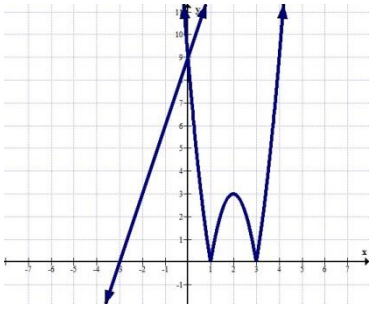
Ⓓ $x \neq 3$

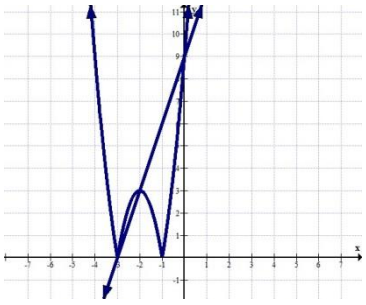
Course: Math 521B Outcome: RF2 Level: 2 Item #: 2015-72-RF2-2

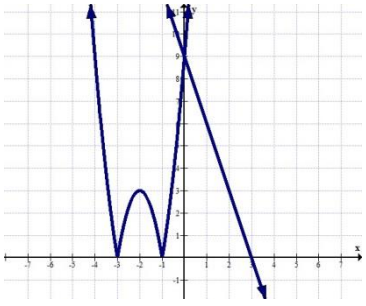
Détermine le graphique qui correspond à la solution de l'équation suivante:

$$|3(x-2)^2-3|=-3x+9$$

Ⓐ 

Ⓑ 

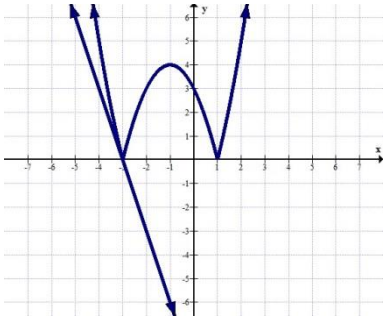
Ⓒ 

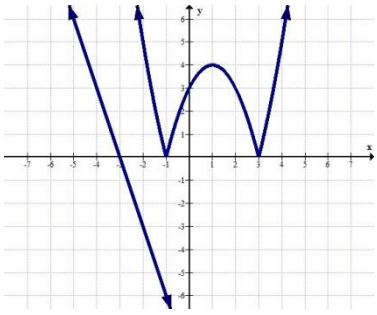
Ⓓ 

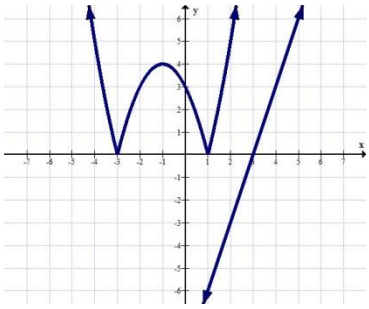
Course: Math 521B Outcome: RF2 Level: 2 Item #: 2015-71-RF2-2

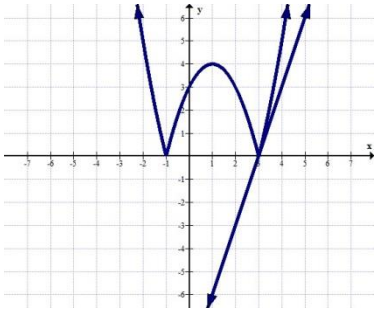
Détermine le graphique qui correspond à la solution de l'équation suivante:

$$|x^2 - 2x - 3| = 3x - 9$$

Ⓐ 

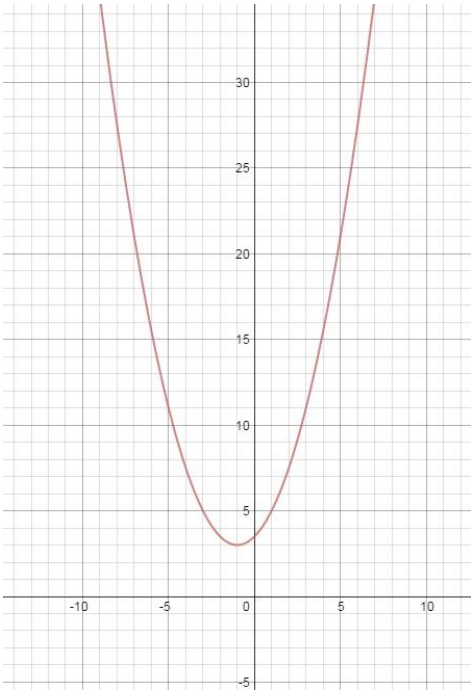
Ⓑ 

Ⓒ 

Ⓓ 

Course: Math 521B Outcome: RF3 Level: 2 Item #: 2015-69-RF3-2

À partir de ce graphique, détermine l'équation de la fonction quadratique de la form canonique.



Ⓐ $y = \frac{1}{2}(x-1)^2 + 3$

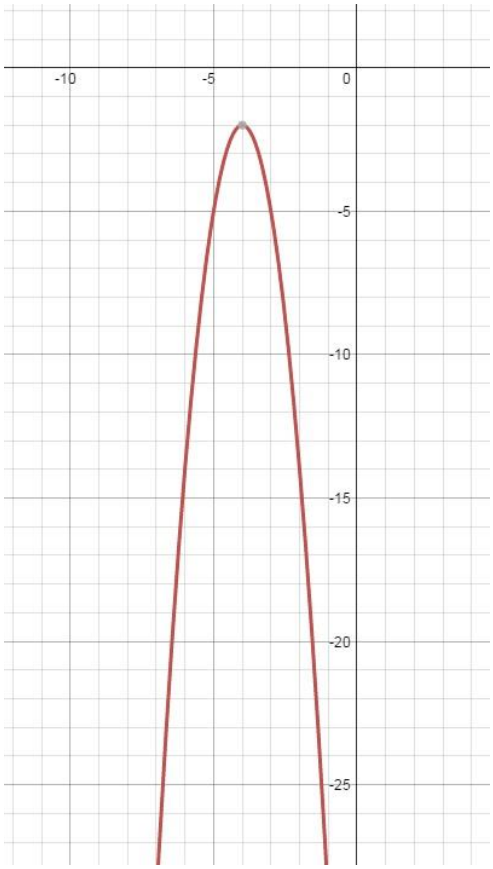
Ⓑ $y = 2(x+1)^2 + 3$

Ⓒ $y = \frac{1}{2}(x+1)^2 + 3$

Ⓓ $y = 2(x-1)^2 + 3$

Course: Math 521B Outcome: RF3 Level: 2 Item #: 2015-68-RF3-2

a partir de ce graphique, determine l'equation de la fonction quadratique de la form canonique.



Ⓐ $f(x) = -3(x-4)^2 - 2$

Ⓑ $f(x) = -3(x+4)^2 - 2$

Ⓒ $f(x) = -3(x-4)^2 + 2$

Ⓓ $f(x) = 3(x+4)^2 - 2$

Course: Math 521B Outcome: RF3 Level: 3 Item #: 2015-66-RF3-3

A pelican dives from the top of a bridge towards the water to catch a salmon. The height, h in meters, of the pelican above the water, t seconds after it begins it's dive can be approximated by the function $h(t) = 3x^2 - 15x + 12$.

What is the height of the bird in relation to the bridge after 2 seconds?

Ⓐ The pelican is below the water level.

Ⓑ The pelican is in the air above the height of the bridge.

Ⓒ The pelican is at the surface level of the water.

Ⓓ The pelican is in the air below the height of the bridge but above the water.

Course: Math 521B Outcome: RF3 Level: 3 Item #: 2015-65-RF3-3

A meatball is tossed upward from the stage in the cafeteria and falls to the ground. The approximate heigh, h in meters, of the meatball above the floor t seconds after being tossed is moedelled by the function $h(t) = -5t^2 + 9t + 2$

What is the height of the meatball in relation to the cafeteria stage after 1 second?

Ⓐ The meatball has hit the ground.

Ⓑ The meatball is in the air below the height of the stage.

Ⓒ The meatball is in the air above the stage.

Ⓓ The meatball is in the air at the same height as the stage.

Course: Math 521B Outcome: RF4 Level: 2 Item #: 2015-10-RF4-2

Fireworks launched from a platform are modelled by the quadratic $h(t) = -0.05t^2 + 3t + 15$. What is the max height that the fireworks will reach?

Ⓐ 15 m

Ⓑ 60 m

Ⓒ 345 m

Ⓓ 845 m

Course: Math 521B Outcome: RF4 Level: 2 Item #: 2015-9-RF4-2

Place the following quadratic function into vertex form.

$$y = -4x^2 - 8x + 2$$

Ⓐ $y = -4(x + 1)^2 + 6$

Ⓑ $y = -4(x - 4)^2 + 66$

Ⓒ $y = -4(x + 1)^2 + 1$

Ⓓ $y = -4(x - 1)^2 + 6$

Course: Math 521B Outcome: RF6 Level: 2 Item #: 2015-37-RF6-2

Solve the following system of equations:

$$y = 2x + 2$$

$$y = x^2 + 6x + 5$$

Ⓐ $x = -7$ or $x = -1$

Ⓑ $(-3, -4)$ and $(-1, 1)$

Ⓒ $(-7, -12)$ and $(-1, 1)$

Ⓓ $x = -3$ or $x = -1$

Course: Math 521B Outcome: RF6 Level: 2 Item #: 2015-36-RF6-2

Solve the following system of equations:

$$y = x + 3$$

$$y = x^2 + 4x + 3$$

Ⓐ No solution

Ⓑ $(-3,0)$ and $(-2,1)$

Ⓒ $x = 0$ and $x = 3$

Ⓓ $(0,3)$ and $(-3,0)$

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-53-RF8-2

Which of the following inequalities would have the given solution:

$$1 \le x \le 3$$

Ⓐ $x^2 - 4x + 3 \le 0$

Ⓑ $x^2 - 4x + 3 \ge 0$

Ⓒ $x^2 - 4x + 3 < 0$

Ⓓ $x^2 - 4x + 3 > 0$

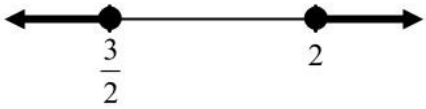
Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-56-RF8-2

Solve by number line:

$$2x^2 - 7x + 6 \geq 0$$

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-55-RF8-2

Solve:

$$-x^2 - 8x - 7 < 0$$

Ⓐ $-7 < x < -1$

Ⓑ $x < 1$ or $x > 7$

Ⓒ $x > -1$ or $x > -7$

Ⓓ $1 < x < 7$

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-54-RF8-2

Which of the following inequalities would have the given solution:

$$x < 2 \text{ or } x > 3$$

Ⓐ $-x^2 + 5x - 6 > 0$

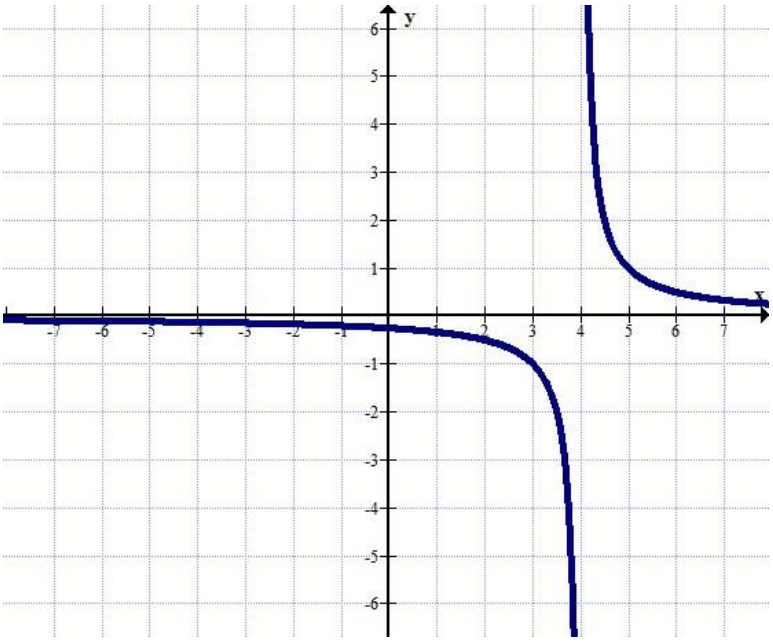
Ⓑ $-x^2 + 5x - 6 \leq 0$

Ⓒ $-x^2 + 5x - 6 \geq 0$

Ⓓ $-x^2 + 5x - 6 < 0$

Course: Math 521B Outcome: RF11 Level: 2 Item #: 2015-70-RF1-2

Shown is a graph at $y = \frac{1}{f(x)}$. What is the x-intercept of the graph at $y = f(x)$?



Ⓐ $x = 4$

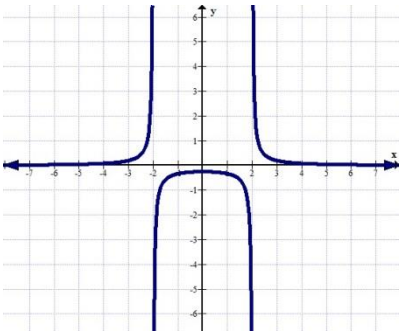
Ⓑ $x = 1$

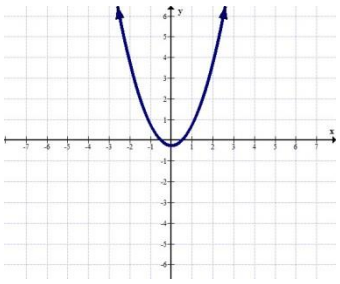
Ⓒ $x = -1$

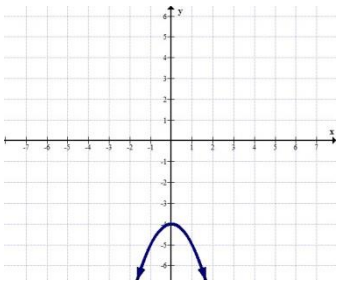
Ⓓ $x = 0$

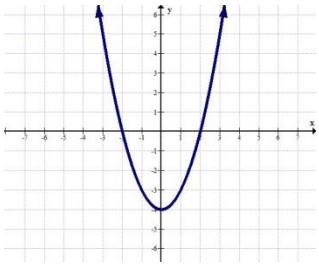
Course: Math 521B Outcome: RF11 Level: 2 Item #: 2015-67-RF11-2

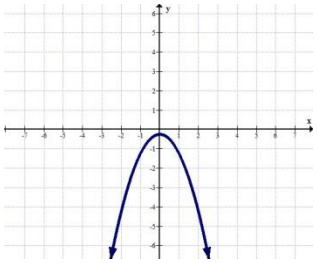
The graph of $y = \frac{1}{f(x)}$ is shown. Identify the graph at $y = f(x)$.



Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-60-T2-2

Given the point $(-3,4)$, determine the exact ratio for $Cos\ \theta$.

Ⓐ $\frac{-3}{\sqrt{7}}$

Ⓑ $\frac{-3}{5}$

Ⓒ $\frac{4}{5}$

Ⓓ $\frac{4}{\sqrt{7}}$

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-59-T2-2

Given $Sin\theta = \frac{-2}{5}$ and θ is a quadrant III angle, determine the exact ratio for $Tan\,\theta$.

Ⓐ $\frac{-2}{\sqrt{21}}$

Ⓑ $\frac{2}{\sqrt{29}}$

Ⓒ $\frac{-2}{\sqrt{29}}$

Ⓓ $\frac{2}{\sqrt{21}}$

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-58-T2-2

Determine the exact ratio for $Sin\ \theta$ when $\theta = 300^0$.

Ⓐ $\frac{-1}{2}$

Ⓑ $\frac{1}{2}$

Ⓒ $\frac{\sqrt{3}}{2}$

Ⓓ $\frac{-\sqrt{3}}{2}$

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-57-T2-2

Determine the exact ratio for $Tan\ \theta$ when $\theta = 135^0$.

Ⓐ $\frac{1}{\sqrt{2}}$

Ⓑ -1

Ⓒ 1

Ⓓ $\frac{-1}{\sqrt{2}}$

Math 521B

Selected Response

Item Bank

Rationale

Course: Math 521B Outcome: AN3 Level: 2 Item #: 2015-63-AN3-2

Which of the following equations has no solution?

Ⓐ $-8\sqrt{4+x}+5=-3$ = -, not possible

Ⓑ $2\sqrt{x-5}-6=-2$ = -, not possible

Ⓒ $6+2\sqrt{x-8}=4$ Correct Answer

Ⓓ $2-3\sqrt{x+4}=-7$ = -, think no solution

Course: Math 521B Outcome: AN3 Level: 2 Item #: 2015-64-AN3-2

Which of the following equations has no solution?

Ⓐ $\sqrt{2x+1}-9=-2$ = -, so think it's not possible, didn't isolate radical

Ⓑ $-\sqrt{2x+1}+9=-2$ = -, so think it's not possible, didn't isolate radical

Ⓒ $\sqrt{2x+1}+9=2$ Correct Answer

Ⓓ $9-\sqrt{2x+1}=2$ Forgot to divide by the negative

Course: Math 521B Outcome: AN4 Level: 1 Item #: 2015-61-AN4-1

Identify the non-permissable values for the following ration expression:

$$\frac{x-2}{x^2-5x+6}$$

Ⓐ $x \neq 2,3$ Correct Answer

Ⓑ $x \neq 3$ They are reducing the rational expression before determing the non-permissable value

Ⓒ $x \neq 0,2,3$ Students believe all rational expressions must have a non-permissable value of x not equal 0, because it is not possible to divide by zero.

Ⓓ $x \neq -3,-2$ Students are forgetting to solve the quadractic by setting each factored binomial equal to zero.

Course: Math 521B Outcome: AN4 Level: 1 Item #: 2015-62-AN4-1

Identify the non-permissable values for the following ration expression:

$$\frac{x-3}{2x^2-6x}$$

Ⓐ $x \neq 0, -3$ Using the wrong value of x

Ⓑ $x \neq 0, 3$ Correct Answer

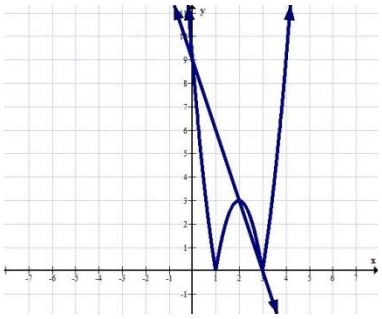
Ⓒ $x \neq 0$ Stating the non-permissable after cancelling

Ⓓ $x \neq 3$ They forget to include the factored monomial expression "2x" on the bottom

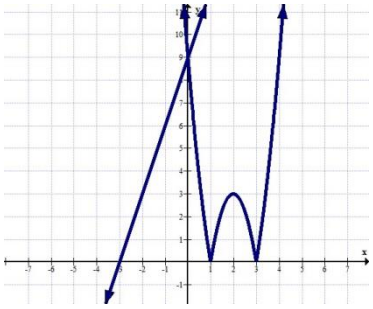
Course: Math 521B Outcome: RF2 Level: 2 Item #: 2015-72-RF2-2

Détermine le graphique qui correspond à la solution de l'équation suivante:

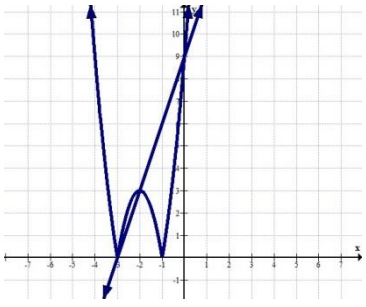
$$|3(x-2)^2-3|=-3x+9$$

Ⓐ 

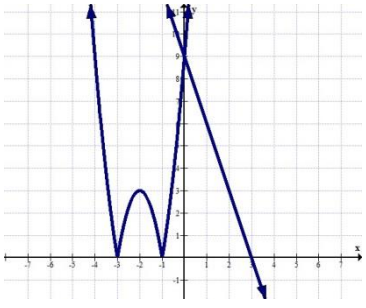
Bonne réponse

Ⓑ 

mauvaise pente

Ⓒ 

mauvais sommet et mauvaise pente

Ⓓ 

mauvais emplacement du sommet

Course: Math 521B Outcome: RF2 Level: 2 Item #: 2015-71-RF2-2

Détermine le graphique qui correspond à la solution de l'équation suivante:

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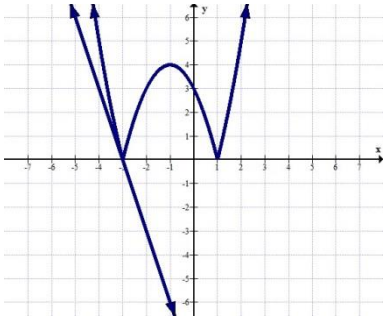
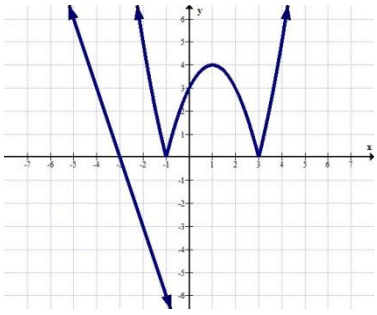
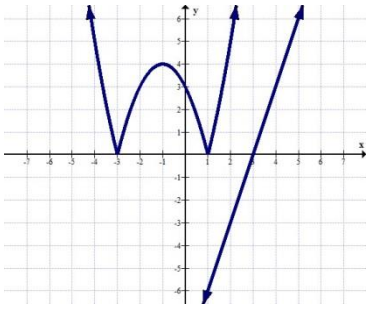
Ⓐ 

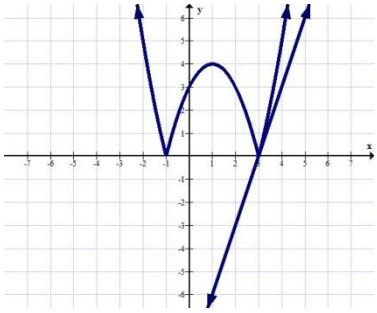
Mauvais sommet et mauvaise pente (inversé)

Ⓑ 

Pente inversée

Ⓒ 

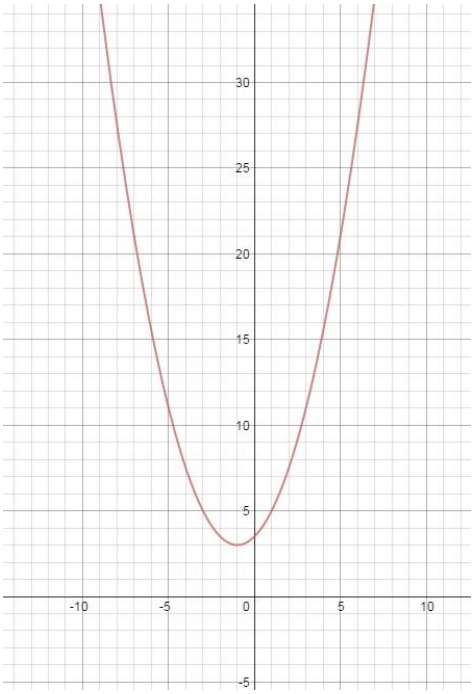
Sommet inversé

Ⓓ 

Bonne réponse

Course: Math 521B Outcome: RF3 Level: 2 Item #: 2015-69-RF3-2

À partir de ce graphique, détermine l'équation de la fonction quadratique de la form canonique.



Ⓐ $y = \frac{1}{2}(x-1)^2 + 3$ Erreur du signe de "p"

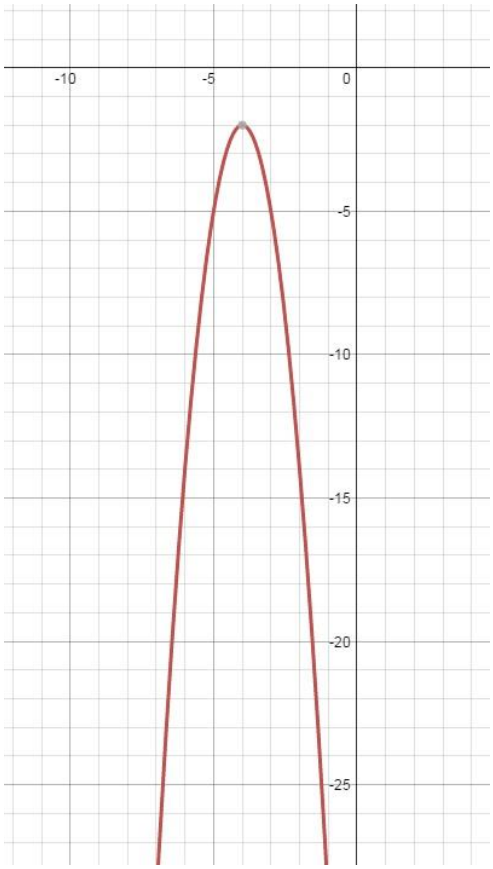
Ⓑ $y = 2(x+1)^2 + 3$ Erreur de calcul pendant la détermination de la valeur de "a"

Ⓒ $y = \frac{1}{2}(x+1)^2 + 3$ Bonne réponse

Ⓓ $y = 2(x-1)^2 + 3$ Combinaison des deux erreurs.

Course: Math 521B Outcome: RF3 Level: 2 Item #: 2015-68-RF3-2

a partir de ce graphique, determine l'equation de la fonction quadratique de la form canonique.



Ⓐ $f(x) = -3(x-4)^2 - 2$ Parfois les eleves regardent rapidement le graphique, ils voient que la valeur de "x" est negatif, et ils oublient qu'il faut changer le sign quand ils ecrivent l'equation.

Ⓑ $f(x) = -3(x+4)^2 - 2$ Correct Answer

Ⓒ $f(x) = -3(x-4)^2 + 2$ Erreur +/- des valeurs de p et q.

Ⓓ $f(x) = 3(x+4)^2 - 2$ Erreur de transcription de signes (a)

Course: Math 521B Outcome: RF3 Level: 3 Item #: 2015-66-RF3-3

A pelican dives from the top of a bridge towards the water to catch a salmon. The height, h in meters, of the pelican above the water, t seconds after it begins it's dive can be approximated by the function $h(t) = 3x^2 - 15x + 12$.

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Ⓑ The pelican is in the air above the height of the bridge.

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A meatball is tossed upward from the stage in the cafeteria and falls to the ground. The approximate heigh, h in meters, of the meatball above the floor t seconds after being tossed is moedelled by the function $h(t) = -5t^2 + 9t + 2$

What is the height of the meatball in relation to the cafeteria stage after 1 second?

Ⓐ The meatball has hit the ground.

Ⓑ The meatball is in the air below the height of the stage.

Ⓒ The meatball is in the air above the stage. Correct Answer

Ⓓ The meatball is in the air at the same height as the stage.

Course: Math 521B Outcome: RF4 Level: 2 Item #: 2015-10-RF4-2

Fireworks launched from a platform are modelled by the quadratic $h(t) = -0.05t^2 + 3t + 15$. What is the max height that the fireworks will reach?

Ⓐ 15 m — Students sub in t=0

Ⓑ 60 m — Correct Answer

Ⓒ 345 m — Students use x = -b/2a and make a negative mistake

Ⓓ 845 m — Students don't multiply -900 by -0.05

Course: Math 521B Outcome: RF4 Level: 2 Item #: 2015-9-RF4-2

Place the following quadratic function into vertex form.

$$y = -4x^2 - 8x + 2$$

Ⓐ $y = -4(x+1)^2 + 6$ Correct Answer

Ⓑ $y = -4(x-4)^2 + 66$ Students don't divide out the -4 from the first 2 terms

Ⓒ $y = -4(x+1)^2 + 1$ Students miss mult the -1 by -4

Ⓓ $y = -4(x-1)^2 + 6$ Student miss dividing out the negative to get +2

Course: Math 521B Outcome: RF6 Level: 2 Item #: 2015-37-RF6-2

Solve the following system of equations:

$$y = 2x + 2$$

$$y = x^2 + 6x + 5$$

Ⓐ $x = -7$ or $x = -1$ — Does not perform the elimination or substitution method properly and does not substitute the x-value inot an equation to solve y

Ⓑ $(-3, -4)$ and $(-1, 1)$ — Correct Answer

Ⓒ $(-7, -12)$ and $(-1, 1)$ — Does not perform elimination or substitution properly.

Ⓓ $x = -3$ or $x = -1$ — Does not stubstitute x into equation to solve for y

Course: Math 521B Outcome: RF6 Level: 2 Item #: 2015-36-RF6-2

Solve the following system of equations:

$$y = x + 3$$

$$y = x^2 + 4x + 3$$

Ⓐ	No solution	thinks that when you factor to get x=0, there is no solution
Ⓑ	$(-3,0)$ and $(-2,1)$	Performed the algebra incorrectly. Moved the equation incorrectly.
Ⓒ	$x = 0$ and $x = 3$	Not substitute back to find y.
Ⓓ	$(0,3)$ and $(-3,0)$	Correct Answer

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-53-RF8-2

Which of the following inequalities would have the given solution:

$$1 \le x \le 3$$

Ⓐ $x^2 - 4x + 3 \le 0$ Misinterpreted inequality

Ⓑ $x^2 - 4x + 3 \ge 0$ Correct Answer

Ⓒ $x^2 - 4x + 3 < 0$ Misinterpreted inequality

Ⓓ $x^2 - 4x + 3 > 0$ Misinterpreted inequality

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-56-RF8-2

Solve by number line:

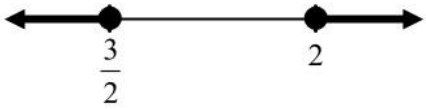
$$2x^2 - 7x + 6 \geq 0$$

Ⓐ 

Misinterpreted inequality

Ⓑ 

Dropped "a" coefficient when factoring

Ⓒ 

Correct Answer

Ⓓ 

Same initial mistake in factoring and misinterpreted inequality

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-55-RF8-2

Solve:

$$-x^2 - 8x - 7 < 0$$

Ⓐ $-7 < x < -1$ Forgot to change the direction of inequality

Ⓑ $x < 1$ or $x > 7$ Factored out the negative from only the first term and not the others.

Ⓒ $x > -1$ or $x > -7$ Correct Answer

Ⓓ $1 < x < 7$ Misinterpreted inequality with two mistakes above.

Course: Math 521B Outcome: RF8 Level: 2 Item #: 2015-54-RF8-2

Which of the following inequalities would have the given solution:

$$x < 2 \text{ or } x > 3$$

Ⓐ $-x^2 + 5x - 6 > 0$ Misinterpret inequality

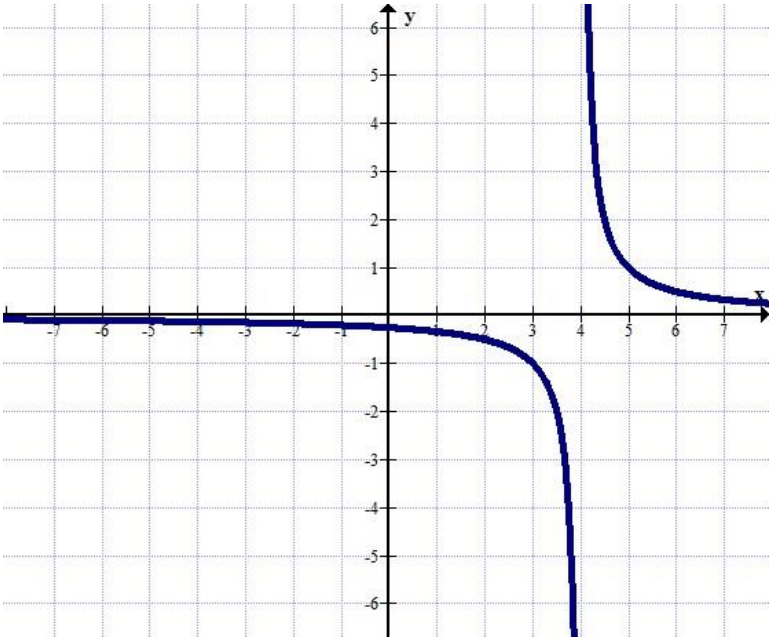
Ⓑ $-x^2 + 5x - 6 \leq 0$ Misinterpret inequality

Ⓒ $-x^2 + 5x - 6 \geq 0$ Misinterpret inequality

Ⓓ $-x^2 + 5x - 6 < 0$ Correct Answer

Course: Math 521B Outcome: RF11 Level: 2 Item #: 2015-70-RF1-2

Shown is a graph at $y = \frac{1}{f(x)}$. What is the x-intercept of the graph at $y = f(x)$?



Ⓐ $x = 4$ Correct Answer

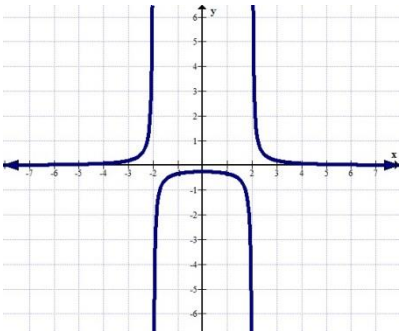
Ⓑ $x = 1$ Students use other points on the provided graph.

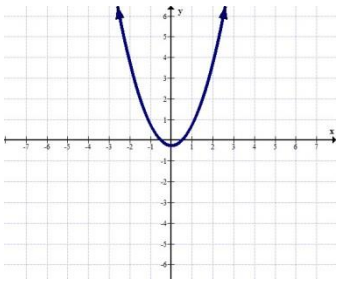
Ⓒ $x = -1$ Students use other points on the provided graph.

Ⓓ $x = 0$ many students use x=0 as on-permissable value regardless of original equation.

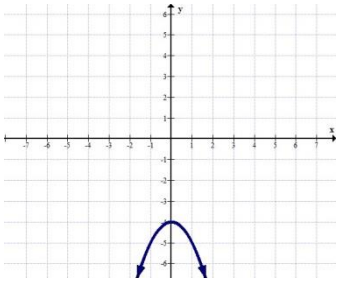
Course: Math 521B Outcome: RF11 Level: 2 Item #: 2015-67-RF11-2

The graph of $y = \frac{1}{f(x)}$ is shown. Identify the graph at $y = f(x)$.

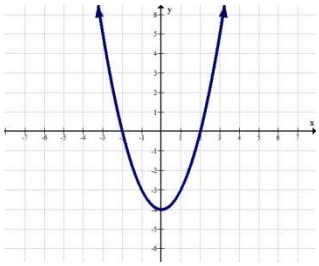


Ⓐ 

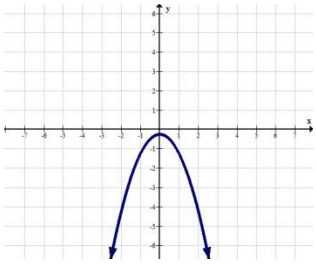
Negleted to use point (0,-4) and instead using point (0,-1/4)

Ⓑ 

Mistakenly considering a negative coefficient

Ⓒ 

Correct Answer

Ⓓ 

Both negative coefficient and using point (0,-1/4)

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-60-T2-2

Given the point $(-3,4)$, determine the exact ratio for $Cos\ \theta$.

Ⓐ $\frac{-3}{\sqrt{7}}$ Found r value

Ⓑ $\frac{-3}{5}$ Correct Answer

Ⓒ $\frac{4}{5}$ Used wrong ratio

Ⓓ $\frac{4}{\sqrt{7}}$ Found wrong r value and used wrong ratio

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-59-T2-2

Given $Sin\theta = \frac{-2}{5}$ and θ is a quadrant III angle, determine the exact ratio for $Tan\,\theta$.

Ⓐ $\frac{-2}{\sqrt{21}}$ Wrong sign

Ⓑ $\frac{2}{\sqrt{29}}$ Kept -4

Ⓒ $\frac{-2}{\sqrt{29}}$ Kept -4 and wrong sign

Ⓓ $\frac{2}{\sqrt{21}}$ Correct Answer

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-58-T2-2

Determine the exact ratio for $Sin\ \theta$ when $\theta = 300^0$.

Ⓐ $\frac{-1}{2}$ Used wrong reference angle

Ⓑ $\frac{1}{2}$ Wrong reference angle and wrong sign

Ⓒ $\frac{\sqrt{3}}{2}$ Wrong sign

Ⓓ $\frac{-\sqrt{3}}{2}$ Correct Answer

Course: Math 521B Outcome: T2 Level: 2 Item #: 2015-57-T2-2

Determine the exact ratio for $Tan\ \theta$ when $\theta = 135^0$.

Ⓐ $\frac{1}{\sqrt{2}}$ Wrong ratio and sign

Ⓑ -1 Correct Answer

Ⓒ 1 Wrong sign

Ⓓ $\frac{-1}{\sqrt{2}}$ Wrong ratio