

Cumulative Review - AIR Practice
Week #1

Problem #1

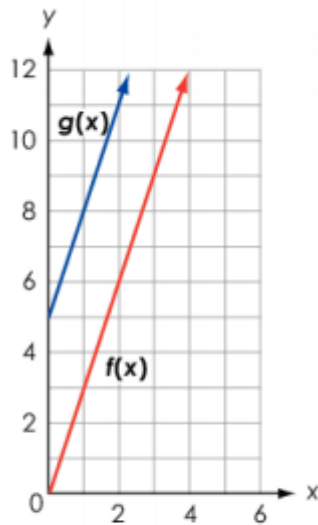
Consider the function $f(x) = x^2 - 5x - 14$.

Are the numbers in the chart zeros of the function?
Select Yes or No in each row.

	Yes	No
2	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>
-2	<input type="checkbox"/>	<input type="checkbox"/>
-7	<input type="checkbox"/>	<input type="checkbox"/>

Problem #2 Ohio 2017 #1

The graphs of two functions, $f(x)$ and $g(x)$, where $g(x) = f(x) + h$, are shown.



Based on the graph, what is the value of h ?

$h =$

Problem #3 Ohio Practice #14

Juan buys peaches and grapefruit at the store. He writes the equations shown to model the relationship between the number of pounds of peaches, p , and the number of pounds of grapefruit, g , that he buys.

$$p + g = 2.5$$

$$1.58p + 1.09g = 3.46$$

What is the total number of pounds of peaches and grapefruit that Juan buys?

pounds

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Problem #4 Ohio 2017 #9

Select all of the expressions that are equivalent to $16^{\frac{5}{2}}$.

- 4^5
- 8^5
- $\sqrt{16^5}$
- $\sqrt[5]{16^2}$
- $(16^2)(16^{\frac{1}{2}})$
- $(16^5)(16^{\frac{1}{2}})$

Problem #5 Ohio 2017 #18

The points $(0, 1)$ and $(1, 4)$ are contained in the graph of an equation with only two variables, x and y .

Select all of the true statements.

- There is exactly one equation in the form $y = mx + b$ that contains these points.
- There are two equations in the form $y = mx + b$ that contain these points.
- There are no equations in the form $y = a \cdot b^x$ that contain these points.
- There is exactly one equation in the form $y = a \cdot b^x$ that contains these points.
- There is more than one equation in the form $y = a \cdot b^x$ that contains these points.

Problem #6 Ohio Practice Test (Integrated Math I) #19

Kenji has at most \$30 to spend on lily bulbs and tulip bulbs at his local flower store. Lily bulbs cost \$4 each, and tulip bulbs cost \$2 each. Tax is included in the prices of the bulbs.

Create a constraint that can be used to represent all possible numbers of lily bulbs, x , and tulip bulbs, y , Kenji can buy.

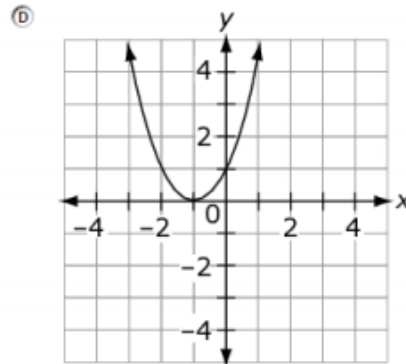
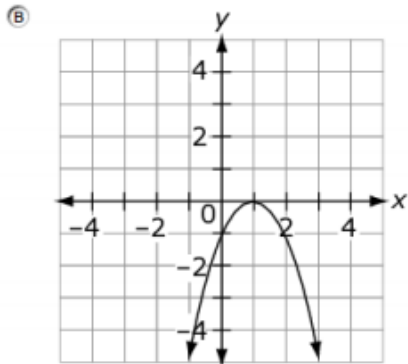
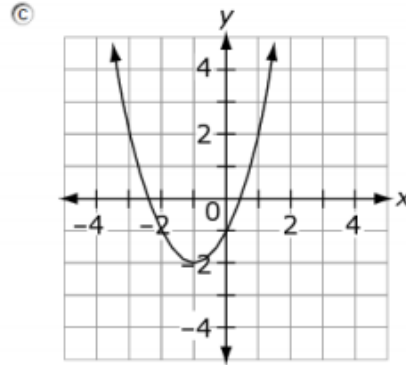
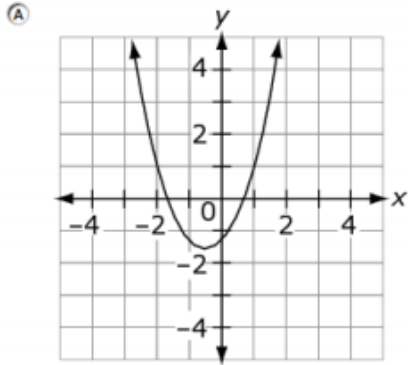
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Problem #7 Ohio 2016 #3

A function is shown.

$$f(x) = x^2 + 2x - 1$$

Which graph represents the function?



Problem #8

What are the zeros of the polynomial $x(x^2 + 4x - 12)$?

Indicate **all** zeros.

- | | |
|---------------------------------|--------------------------------|
| <input type="checkbox"/> A. -12 | <input type="checkbox"/> E. 0 |
| <input type="checkbox"/> B. -6 | <input type="checkbox"/> F. 2 |
| <input type="checkbox"/> C. -3 | <input type="checkbox"/> G. 6 |
| <input type="checkbox"/> D. -2 | <input type="checkbox"/> H. 12 |

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Problem #9 Ohio Practice #15

Select all of the expressions that are equivalent to $9x^4 - y^2$.

- $(3x^2 - y)^2$
- $(3x^2)^2 - (y)^2$
- $9(x^2)^2 - (y)^2$
- $(9x^2)^2 - (y)^2$
- $(3x^2 + y)(3x^2 - y)$

Problem #10 Ohio Practice Test #23

The first five terms of a sequence are shown.

4, 12, 36, 108, 324, ...

Write an explicit function to model the value of the n th term in the sequence such that $f(1) = 4$.

$f(n) =$

Problem #11 Ohio Practice Test

Fred solved the equation $8(3x - 7) = -6(x + 7) + 4$ as shown.

Given	$8(3x - 7) = -6(x + 7) + 4$
Step 1	$24x - 56 = -6x - 42 + 4$
Step 2	$24x - 56 = -6x + 46$
Step 3	$30x = 102$
Step 4	$x = \frac{17}{5}$

Fred made an error between Step 1 and Step 2.

- A. Explain the error that Fred made.
- B. What is the solution to the original equation?

Type your answers in the space provided.

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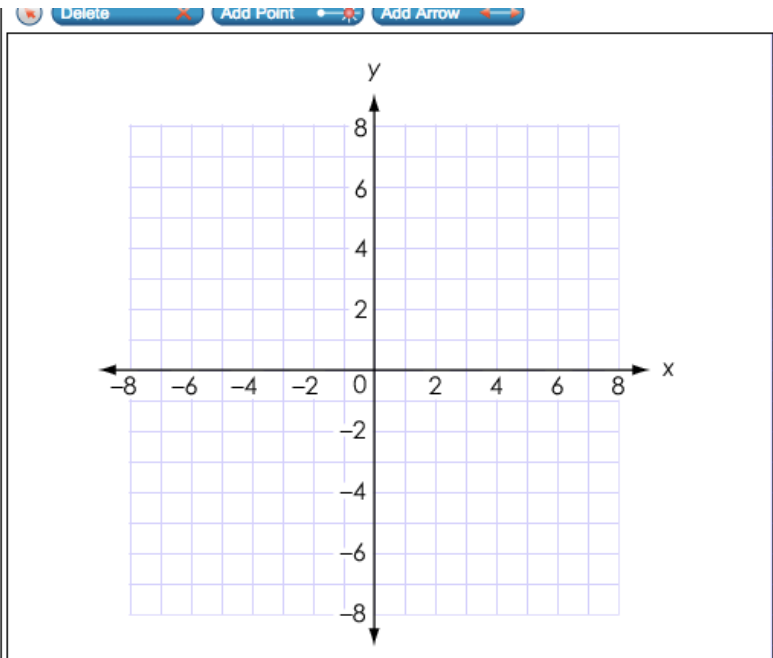
Problem #12 Ohio Practice Test

A system of inequalities is shown.

$$y \geq 5$$

$$y \leq \frac{2}{3}x + 3$$

- A. Use the Add Arrow tool to graph the boundary lines of the system.
- B. Place a star on the coordinate plane to show one solution to the system.



Problem #13 Ohio Practice Test #18

The graph of a quadratic function $f(x)$ intersects the x -axis at -3 and 5 .

What is a possible equation for $f(x)$?

$$f(x) = \text{[input box]}$$

Problem #14 Ohio Practice Test

Complete the first table so that $f(x)$ is a function.

Complete the second table so that $g(x)$ is not a function.

x	$f(x)$		x	$g(x)$
-1	<input style="width: 60px; height: 20px;" type="text"/>		-1	<input style="width: 60px; height: 20px;" type="text"/>
<input style="width: 60px; height: 20px;" type="text"/>	-8		<input style="width: 60px; height: 20px;" type="text"/>	-8
6	<input style="width: 60px; height: 20px;" type="text"/>		6	<input style="width: 60px; height: 20px;" type="text"/>

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Problem #15 Ohio 2016 #4

Solve the equation $x^2 + 6x = -\frac{11}{4}$.

- (A) $x = -3$ and $x = 2$
- (B) $x = -2$ and $x = 3$
- (C) $x = \frac{1}{2}$ and $x = -\frac{11}{2}$
- (D) $x = -\frac{1}{2}$ and $x = -\frac{11}{2}$

Problem #16 Ohio Practice Test #8

8



A system of equations is shown.

$$y = 3x - 2$$
$$y = x^2$$

(<input type="text"/>	,	<input type="text"/>)
(<input type="text"/>	,	<input type="text"/>)

What are the solutions to the system of equations?

Problem #17 Ohio Practice #16

The population of rabbits on a large island doubles every year. On January 1, the population is 150 rabbits.

Which equation can be used to find the number of years, x , it will take for the population to reach 4,800?

- (A) $4,800 = 2x + 150$
- (B) $4,800 = 2 \cdot 150^x$
- (C) $4,800 = 2^x + 150$
- (D) $4,800 = 150 \cdot 2^x$

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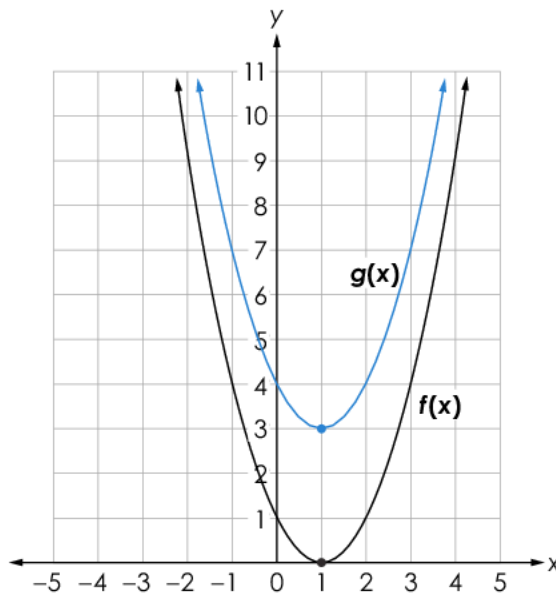
Problem #18 Ohio Practice #13

Which expression is equivalent to $(2x^2 + 3)(x + 4)$?

- (A) $2x^3 + 12$
- (B) $2x^2 + 11x + 12$
- (C) $2x^3 + 6x^2 + 4x + 12$
- (D) $2x^3 + 8x^2 + 3x + 12$

Problem #19 Ohio Practice Test #1

Function $f(x)$ undergoes a single transformation to create function $g(x)$. The graphs of both $f(x)$ and $g(x)$ are shown.



Create $g(x)$ in terms of $f(x)$.

$g(x) =$

Problem #20 Ohio Practice Test

A scientist is studying wildlife. She estimates the population of bats in her state to be 270,000. She predicts the population to grow at an average annual rate of 2.9 percent.

Using the scientist's prediction, create an equation that models the population of bats, y , after x years.

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Problem #21 Ohio Practice Test #19

An equation is shown.

$$y = \frac{1}{2}x + \frac{3}{4}$$

Select all of the points that are contained in the graph of the equation.

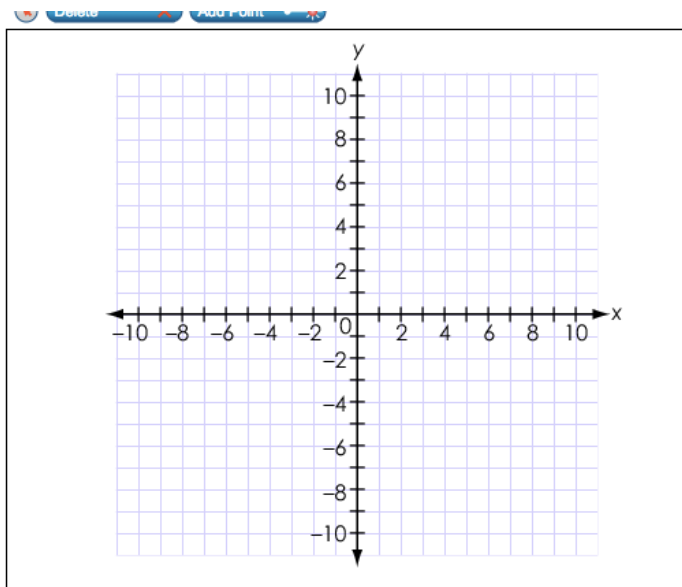
- $(0, \frac{1}{2})$
- $(0, \frac{3}{4})$
- $(\frac{3}{4}, 0)$
- $(\frac{3}{4}, \frac{1}{2})$
- $(\frac{1}{2}, 1)$

Problem #22 Ohio Practice Test

A function is shown.

$$f(x) = x^2 + 2x - 3$$

Use the Add Point tool to show the x -intercepts and maximum or minimum of the function.



Problem #23 Ohio Practice Test #20

A function is shown.

$$f(x) = \frac{2}{3}x + 3$$

What is the value of $f(12)$?

$$f(12) = \text{[input box]}$$

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Problem #24

The function f is defined as $f(x) = x(x^2 - 4) - 3x(x - 2)$.

Part A

An equivalent form of f is given as $f(x) = x(x - 2)(x - a)$, where a is a constant. What is the value of a ?

Enter your answer in the box.

$a =$

Problem #25

What is the sum of the roots of the equation $2x^2 + 5x - 3 = 0$?

- A. -3.5
- B. -2.5
- C. -1.5
- D. 2.5

Problem #26 **Part A is NOT required******

Consider the function $f(x) = x^2 + bx - 16$, where b is a constant.

Part A

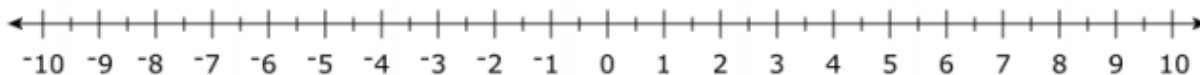
If the function has an axis of symmetry at $x = 5$, what is the value of b ?

Enter your answer in the box.

Part B

If $b = -6$, what are the zero(s) of the function?

Select the location(s) to plot the zero(s) on the number line.



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Problem #27

Select from the drop-down menus to correctly complete the sentence.

To solve the equation $x^2 - x - 2 = 0$ for x by completing the square, a student could use the equivalent equation $(x - \text{Choose..})^2 = \text{Choose..}$.

Choose.. ▾	Choose.. ▾
-1/4	-1/4
1/4	1/4
-1/2	-1/2
1/2	1/2
-9/4	-9/4
9/4	9/4
-3/2	-3/2
3/2	3/2

Problem #28 Ohio Practice Test #24

A landscaper puts 5 fish into a new pond. The number of fish doubles each month over a period of time.

Write a function $f(x)$ to model the number of fish in the pond after x months.

$f(x) =$

Problem #29 Ohio Practice Test #28

A function is shown.

$$f(x) = 5(x - 2)^2 + 3$$

What is the minimum value of the function?

Problem #30 Ohio Practice Test #29

A sequence of steps for solving the equation $3(x - 2) = x + 4$ is shown.

Move a property to each blank box to show the reason for each step.

Step	Property
$3(x - 2) = x + 4$	Given
$3x - 6 = x + 4$	<input style="width: 80%; height: 20px;" type="text"/>
$2x - 6 = 4$	<input style="width: 80%; height: 20px;" type="text"/>
$2x = 10$	<input style="width: 80%; height: 20px;" type="text"/>
$x = 5$	<input style="width: 80%; height: 20px;" type="text"/>

Addition property of equality

Multiplication property of equality

Distributive property

Associative property

Commutative property

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Problem #31 Ohio Practice Test #25

Which expression is equivalent to $(8x^3)^{\frac{2}{3}}$?

- (A) $4x^2$
- (B) $4x^3$
- (C) $\sqrt{8x^9}$
- (D) $\sqrt{(8x^3)^3}$

Problem #32 Ohio Practice Test #26

A shipping company charges a cost per pound plus a fixed fee to ship a package. The total cost, $f(x)$, in dollars, of shipping x pounds is modeled by the function shown.

$$f(x) = 4.99x + 5.75$$

Which part of the function represents the fixed fee?

- (A) x
- (B) 4.99
- (C) 5.75
- (D) $4.99x$