


Released Items

Published October 2018

NC Math 1 North Carolina End-of-Course Assessment

 Public Schools of North Carolina
Department of Public Instruction | State Board of Education
Division of Accountability Services/North Carolina Testing Program

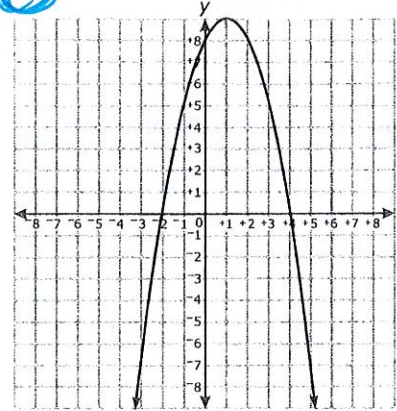
Copyright © 2018 by the North Carolina Department of Public Instruction. All rights reserved.



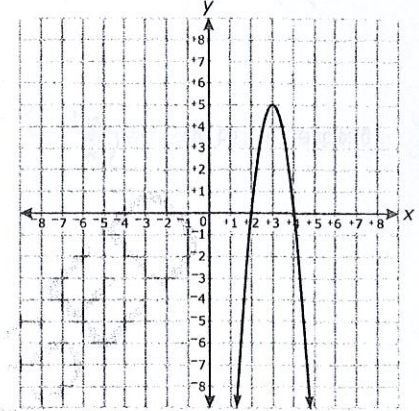
- 1 Which choice is the graph of $y = (4 - x)(x + 2)$?

Zeros are
 $x=4$ and $x=-2$

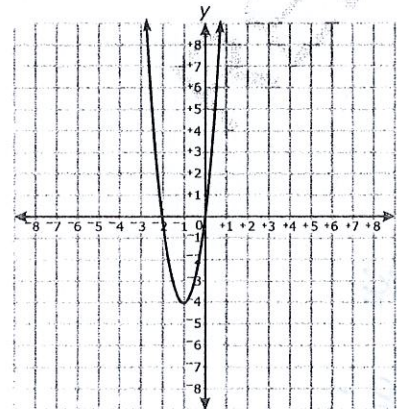
A



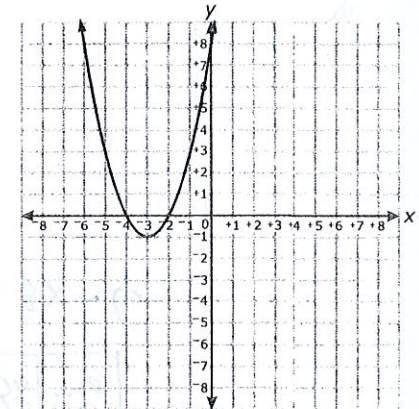
B



C



D



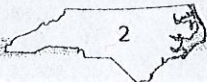
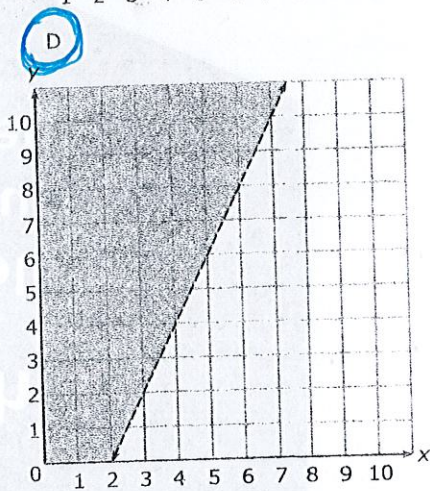
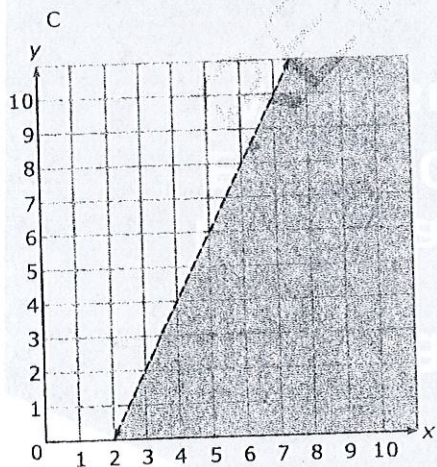
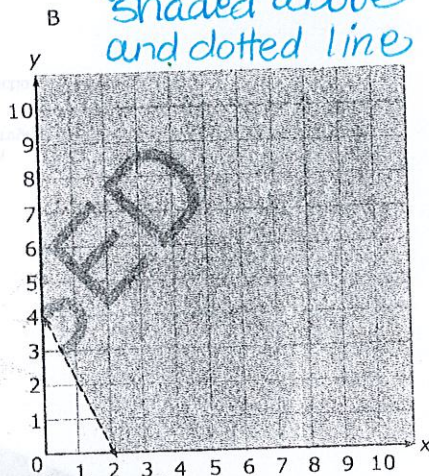
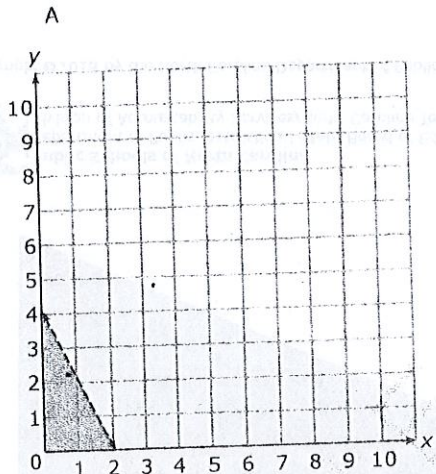
Go to the next page. 



- 2 In which graph does the shaded region represent the solution set for the inequality shown below?

$$2x - y < 4$$

Solve for y
greater than is
shaded above
and dotted line



Go to the next page.



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

- A $3x^2 - 6$
- B $3x^2 + 3x - 6$
- C $3x^2 + 6x - 6$
- D $3x^2 + 9x - 6$

Multiply polynomials

$$\begin{array}{r} x+2 \\ 3x \quad \boxed{\begin{array}{|c|c|} \hline 3x^2 & +6x \\ \hline \end{array}} \\ -3 \quad \boxed{\begin{array}{|c|c|} \hline -3x & -6 \\ \hline \end{array}} \\ \hline \end{array}$$

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



Go to the next page.



Questions 4 through 6 are gridded response items that require you to write your answers in the boxes provided on your answer sheet. Write only one number or symbol in each box and fill in the circle in each column that matches what you have printed. Fill in only one circle in each column.

- 4 A line, $y = mx + b$, passes through the point (1, 6) and is parallel to $y = 4x + 6$. What is the value of b ?

Parallel lines have same slope
 $m=4$
 $6 = 4(1) + b$
 $2 = b$

- 5 Two functions are shown below.

$$f(x) = \frac{1}{2} \cdot 2^x$$

$$g(x) = 5x + 2$$

What is the largest integer value of x such that $f(x) \leq g(x)$?

$x=6$

- 6 A company models its net income, in thousands of dollars, with the function $f(x) = 9x^2 - 54x - 144$, where x is the number of units of its product sold. How many units of its product does the company need to sell in order for the net income to equal \$0?

GCF = 9 $\Rightarrow 9(x^2 - 6x - 16) = 0$
 $9(x-8)(x+2) = 0$

$x-8=0$ $x+2=0$
 $x=8$ $x=-2$



Go to the next page.



- 7 Joanna has a total of 50 coins in her purse.
- The coins are either nickels or quarters.
 - The total value of the coins is \$7.10.

Which system of equations can be used to determine the number of nickels, n , and quarters, q , that Joanna has in her purse?

A $n + q = 50$
 $0.05n + 0.25q = 7.10$

B $n + q = 7.10$
 $50n + 50q = 7.10$

C $0.05n + 0.25q = 50$
 $n + q = 7.10$

D $0.05n + 0.25q = 7.10$
 $50n + 50q = 7.10$

- 8 The function $f(x) = -0.25x + 5$ models the height of a candle x seconds after it is lit. What is the meaning of the y -intercept of the function?

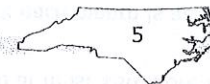
A the initial height of the candle

B the final height of the candle

C the rate at which the candle is burning

D the amount of time it will take the candle to burn

y-intercept is the starting point



Go to the next page.



Questions 9 and 10 are gridded response items that require you to write your answers in the boxes provided on your answer sheet. Write only one number or symbol in each box and fill in the circle in each column that matches what you have printed. Fill in only one circle in each column.

- 9 The total cost, in dollars, of membership in a fitness center is given by the function $c(m) = 20m + 40$, where m is the number of months a person is a member. In dollars, how much is the cost of a membership for 1 year?

1 year = 12 months
 $20(12) + 40 = 280$

- 10 Water is being pumped into a 10-foot-tall cylindrical tank at a constant rate.

- The depth of the water is increasing linearly.
- At 1:30 p.m., the water depth was 2.4 feet.
- It is now 4:00 p.m., and the depth of the water is 3.9 feet.

What will the depth (in feet) of the water be at 5:00 p.m.?

Constant rate \Rightarrow slope
 Change time into constants counting by 30 minutes

0 \rightarrow 1:30
 5 \rightarrow 4:00
 7 \rightarrow 5:00

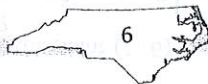
x	y
0	2.4
5	3.9
7	?

$$m = \frac{3.9 - 2.4}{5 - 0} = 0.3$$

$$y = 0.3x + 2.4$$

$$y = 0.3(7) + 2.4$$

$$y = 4.5$$



Go to the next page.



- 11 Sally works at a store.

- x represents Sally's monthly paycheck, and y represents her monthly savings.
- Sally will save at least \$20 more than half of her paycheck each month.
- She can save at most \$80 more than two-thirds of her paycheck each month.
- Her paycheck each month is at least \$1,200, but no more than \$1,850.

Which system of inequalities represents these constraints?

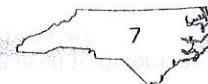
A $x \leq \frac{1}{2}y + 20$
 $x \geq \frac{2}{3}y + 80$
 $y \leq 1,200$
 $y \geq 1,850$

B $y \geq \frac{1}{2}x + 20$
 $y \leq \frac{2}{3}x + 80$
 $x \geq 1,200$
 $x \leq 1,850$

C $y \leq \frac{1}{2}x + 20$
 $y \geq \frac{2}{3}x + 80$
 $x \leq 1,200$
 $x \geq 1,850$

D $x \geq \frac{1}{2}y + 20$
 $x \leq \frac{2}{3}y + 80$
 $y \geq 1,200$
 $y \leq 1,850$

need to know key words that go along with inequality signs



Go to the next page.



- 12 A company uses the formula $T = 581s + 150p$ to determine the total cost to purchase s computers and p printers. Which formula can be used to determine the number of printers purchased, given the total cost, T , and the number of computers purchased?

- A $p = \frac{T}{150} - 581s$
 B $p = T - \frac{581s}{150}$
 C $p = \frac{T - 581s}{150}$
 D $p = T - 581s - 150$

Solve equation for P

$$\begin{array}{r|l}
 T = 581s + 150p & \\
 -581s & -581s \\
 \hline
 T - 581s = 150p & \\
 \hline
 150 & 150
 \end{array}$$

$$\boxed{\frac{T - 581s}{150} = p}$$



Questions 13 through 15 are gridded response items that require you to write your answers in the boxes provided on your answer sheet. Write only one number or symbol in each box and fill in the circle in each column that matches what you have printed. Fill in only one circle in each column.

- 13 What is the value of the positive zero of the function, f , defined by $f(x) = x^2 - 121$?

Difference of Squares

$$\sqrt{x^2} = x \\
 \sqrt{121} = 11$$

$$(x+11)(x-11) = 0$$

$$x+11=0 \\
 x=-11$$

$$x-11=0 \\
 \boxed{x=11}$$

- 14 What is the value of x in the system of equations shown below?

Substitute value of y into first equation

$$5x + 4y = 1 \\
 y = 1 - x$$

$$5x + 4(1-x) = 1$$

$$5x + 4 - 4x = 1$$

$$x + 4 = 1 \\
 \boxed{x = -3}$$

- 15 What is the value of the smaller zero of the function $f(x) = 2x^2 - 8x - 24$?

$$GCF = 2 \Rightarrow 2(x^2 - 4x - 12) = 0$$

$$2(x-6)(x+2) = 0$$

$$x-6=0 \\
 x=6$$

$$x+2=0 \\
 \boxed{x=-2}$$

This is the end of the calculator inactive released items.



Go to the next page.

