# 2004 Algebra 2 Pretest answers and scoring

## Part A. Multiple choice questions.

***Directions**:* Circle the letter ( A, B, C, D, or E ) next to the correct answer.
2 points each, no partial credit

**1.** Which one of the following expressions is **not** equal to all the others?

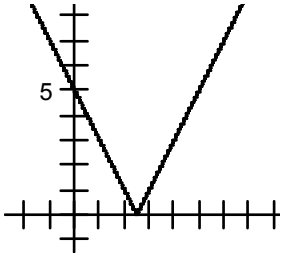
A. $-\frac{1}{x^2}$ B. $\frac{-1}{x^2}$ C. $\frac{1}{-x^2}$ **D.** $\frac{1}{x^{-2}}$ E. $-\frac{x^2}{x^4}$

**2.** Simplify this expression as much as possible. $25x^{-3} \bullet \frac{(2xy)^3}{10x^2}$

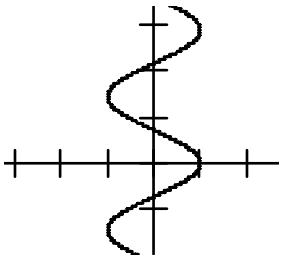
A. $\frac{20y^3}{x^2}$ B. $\frac{5y^3}{x^2}$ C. $\frac{5y^3}{x^4}$ D. $\frac{4y^3}{125x^5}$ E. $20x^4y^3$

**3.** Which of following graphs could be the graph of a function?

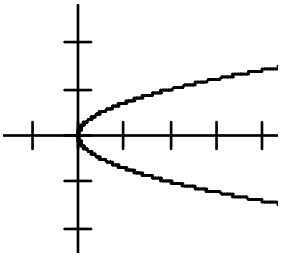
I.



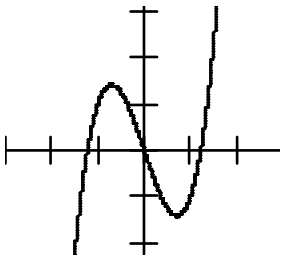

II.



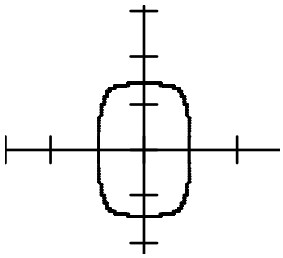
III.



IV.



V.



a. I, II, III, IV b. I and IV c. II and III d. V e. I, III, IV, V

**4.** Find the value of $y$ so that the line passing through the points (0,-2) and (2,$y$) has a slope equal to 3.

A. -4 B. -8 C. 8 D. 4 E. $1\frac{1}{3}$

**5.** What is the factored form of $2x^2 - 6 = 4x$ ?

A. $(x - 3)(x + 1)$ B. $(x - 6)(x + 1)$ C. $(x + 3)(2x - 2)$

D. $2(x - 3)(x + 1)$ E. $2(x + 6)(x - 1)$

## Part B. Writing points, equations, tables, graphs, and functions

***Directions:*** Make sure your answers are neat and complete.

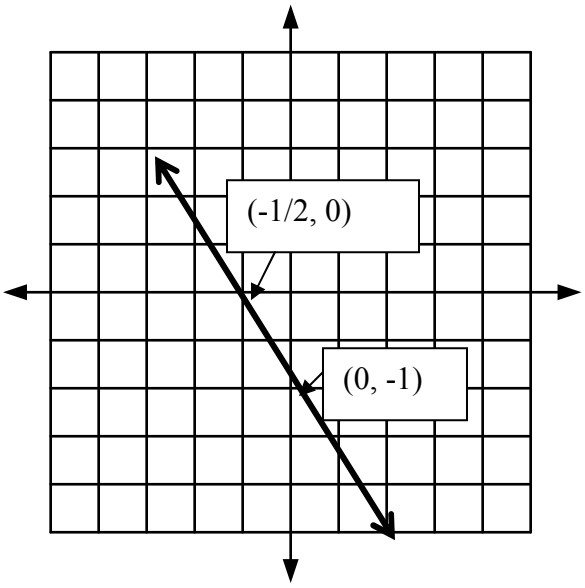
**1.** Here is a function whose graph is a line: f($x$) = -2$x$-1.

a. Write the coordinates of the point that is the $y$-intercept. __(0, -1) 1 point

b. Write the coordinates of a point that is on the $x$-axis and also on this line.

(-1/2, 0) 1 point

c. On the grid below, make a graph for this function. Label two points.1 point



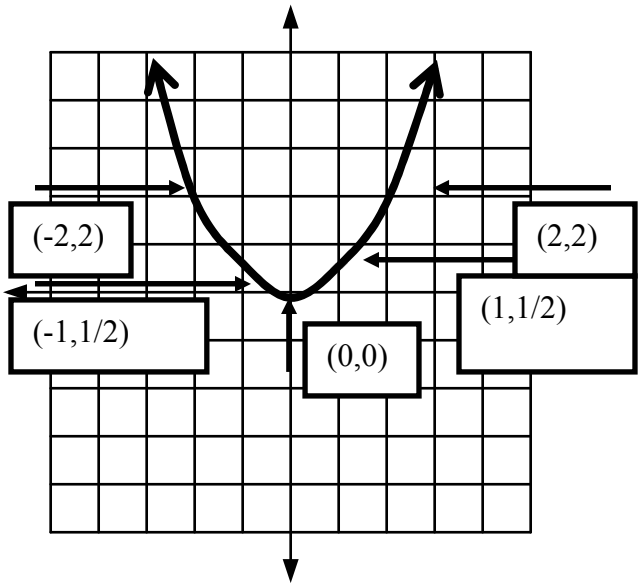
**2.** Here is a word description of a function: "Square the number, then divide by two."

1 point each for a, b, and c

a. Write an equation for this function. **$F(x) = (x^2)/2$**

b. What is the name of this type of function? Quadratic function

c. On the grid below, make a graph for this function. Label five points on this graph.




**3.** Evaluate the following equation for the values of *x* given in the table below.

$$y = \left(\frac{1}{3}\right)^x$$

1 point for 1-2 correct
2 points for 3- 4 correct
3 points for 5 – 6 correct

| x | y |
|---|---|
| -2 | **9** |
| -1 | **3** |
| 0 | **1** |
| 1 | **1/3** |
| 2 | **1/9** |

What kind of equation is this? **exponential**

**4.** Is it possible to find another line that is parallel to $3x + 9y = 1$ and passes through the point $\left(0, \frac{1}{9}\right)$? 1 point for NO, 2 points for explanation
1 point for supporting incorrect answer reasonably

Yes **No** Sometimes (*circle a response*)

Explain your reasoning on the lines below.

The point is already on the line and parallel lines have the same slope. There is no other line that can pass through the same point and have the same slope on the coordinate plane.

## Part C. Solving and simplifying

*Directions:* Show all your work in the spaces provided.

**1.** Solve this equation for $b_1$: $A = \frac{h}{2}(b_1 + b_2)$

(Note: This is the formula for the area of a trapezoid where h is the height, $b_1$ and $b_2$ are the two bases, and A is the area.)

**Show your solving steps here:**
2 points

$$A = \frac{h}{2}(b_1 + b_2)$$

$$\frac{2A}{h} = (b_1 + b_2)$$

$$\frac{2A}{h} - b_2 = b_1$$

**Write your solution here:**

$$\frac{2A}{h} - b_2 = b_1$$

1 point

**2.** A 6 foot tree is planted beside a building that is 16 feet tall. The tree grows 1.25 feet per year. At this rate, **after** how many years will the tree be taller than the building?

a. Write an inequality to represent this problem. 1 point

x = number of years

1.25x + 6 > 16
X > (16 – 6)(1/1.25)
X > 8

b. Solve the inequality. Show all work below. 2 points

**3.** Solve this system of equations.

$y = 2x + 2$
$4x - y = -6$

**2 points for work and 1 point for solution**

**Substitute: 4x – (2x + 2) = -6**
**2x = -4**
**X = -2**
**Y = 2(-2) + 2 = -2**

**4.** Expand the expression $(2p - 7)^2$ **$4p^2 - 28p + 49$**

**0 points for $4p^2 \pm 49$**
**1 point for 2 instead of 4 in 1st coefficient**
**1 point for ± 28 in the 2nd term**
**1 point for ± 14 in the 2nd term**

**5.** Solve the equation $|-2x + 3| = 5$

_____

**1 point for answer**
**3 points for answer and solution (2 branches)**
**2 points for simple arithmetic error**

**SOLVE: -2x + 3 = 5 and - 2x + 3 = -5**
**x = (5-3)/(-2)**
**x = -1**
**and**
**x = (-5-3)/(-2)**
**x = 4**

**6.** Evaluate $-x^2 + x$ when $x = -4$
**2 points for correct answer, no work**
**1 point for correct substitution, incorrect arithmetic**

**$-(-4^2) + (-4) = -16 - 4 = -20$**

## Part D. Real world problems

***Directions:*** Show all work for these open response problems.

**1.** On January 1, a company had $360,000.00 in an account. On June 1 of the same year, the same company had $210,000.00 in its account. If the amount in the company's account changed by an equal amount each month, find the rate of change. Label your answer with the correct units.

_____

1 point for units
1 point for correct answer

1 point for work

RATE OF CHANGE = CHANGE IN $$ / MONTH
RATE OF CHANGE = (360,000 – 210,000) / 5
RATE OF CHANGE = $150,000/5 MONTHS
= - $30,000 per month

**2.** Next summer Thomas plans to mow lawns in his neighborhood to earn money for a new pair of rollerblades. The relationship between the hours he will work (*h*) and the amount of money that he can earn (*d*) is shown in the table below:

| Hours (*h*) | Money Earned (*d*) |
|---|---|
| 1 | $6.00 |
| 2 | $12.00 |
| 3 | $18.00 |
| 4 | $24.00 |

a. Based on this data, how much would you predict that Thomas can earn for 6 hours of work?

Thomas can earn 6*G = 36 DOLLARS (1 point)

b. Based on this data, how much would you predict that Thomas could earn for *h* hours of work?

Thomas can earn $ 6 *h* (1 point)

c. Based on this data, how many hours would you predict that Thomas would have to work to earn $ 270.00?

270 = 6H
H = 270 / 6 = 90/2 = 45 HOURS (1 POINT)

d. Write a formula that uses the given variables to represent this problem.
(2 pointS)
FORMULA: d = 6H
(d = DOLLARS EARNED H = HOURS WORKED)

e. What are the numerical values of the slope and the intercept? (The intercept in this case refers to the intercept of the "Money Earned" axis )

Slope = 6 Intercept = (0,0)
(2 points – full credit if this matches a wrong answer in part D)