MATH 103: Test 2
60 minutes [100 points]   Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Multiply:
     1) $(3x + 7)(x + 10)$ 1) _____

Factor the trinomial into the product of two binomials.
     2) $x^2 + 4x - 77$ 2) _____

     3) $6x^2 - 9x + 3$ 3) _____

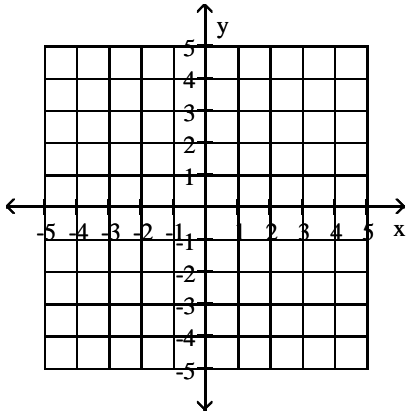**Solve the quadratic equation, to determine all solutions of x:**
     4) $x^2 - x = 12$ 4) _____

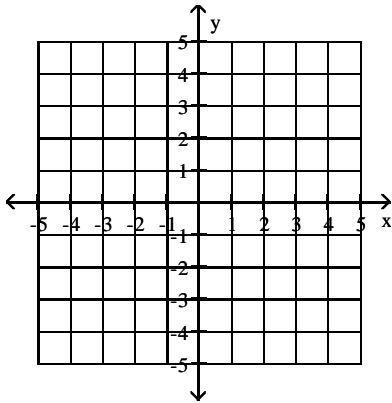   5) $x^2 + 10x + 3 = 0$ 5) _____

Write your answer in the space provided.

Graph the equation.

6) $y = \dfrac{1}{3}x - 4$

Use the x– and y–intercepts to graph the linear equation.

7) $2x - 6y = 4$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

8) The function $f(x) = 0.81x + 168.3$ models the cholesterol level of an American woman as a function of her age, x, in years. Use the function to find $f(44)$.

8) _____

Calculate the slope of the line passing through the given points. If the slope is undefined, so state. Then indicate whether the line rises, falls, is horizontal, or is vertical.

9) $(-6, 2),\ (-2, 5)$

9) _____

Write your answer in the space provided.

The graph shows that the cost of the average college mathematics textbook has been rising steadily since 1990.
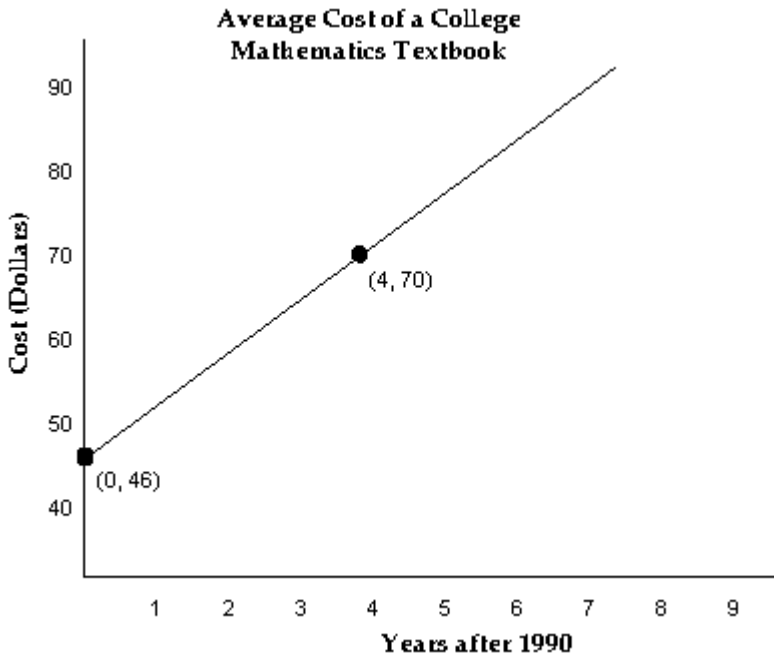
10) a. What is the equation of this line, in slope–intercept form?   _____(5 pts)

   b. Predict the cost of an average college mathematics textbook in 2014.   _____(5 pts)

Solve the problem.

11) A truck rental company rents a moving truck one day by
   charging $39 plus $0.09 per mile.
   Write a linear equation that relates the cost C, in dollars,
   of renting the truck to the number x of miles driven.   _____(5 pts)

   Also What is the cost of renting the truck if the truck is driven 160 miles?   _____(5 pts)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the system by the substitution method. Be sure to check all proposed solutions.

12) $x - 3y = -2$
     $-2x - 2y = 4$ 12) _____

13) $x + 2y = 38$ 13) _____
     $y = 3x + 5$

Solve the problem.

14) Devon purchased tickets to an air show for 8 adults and 2 children. The total cost was $232.   14) _____
The cost of a child's ticket was $4 less than the cost of an adult's ticket. Find the price of an
adult's ticket and a child's ticket.

Write your answer in the space provided.

Use a calculator with a $\left[y^x\right]$ key or a $\left[\wedge\right]$ key to solve the problem.

15) The exponential function $f(x) = 43.28(1.022)^x$ describes the population of a certain country, y,
in millions, x years after 1980.

a) Substitute 0 for x and, without using a calculator, find the country's population in 1980._____(5 pts)

b) Find the country's population in the year 2003 as predicted by this function.   _____(5 pts)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem. Use a calculator with an LN or a LOG key.

16) An earthquake was recorded with an intensity which was 15,849 times more powerful than   16) _____
a reference level earthquake, or $15{,}849 \cdot I_0$. What is the magnitude of this earthquake on the
Richter scale (rounded to the nearest tenth)? The magnitude on the Richter scale of an

earthquake of intensity I is $\log_{10} \dfrac{I}{I_0}$.

**First, create a scatter plot for the data in the table. Then, use the shape of the scatter plot given to
determine if the data are best modeled by a linear function, an exponential function, a logarithmic
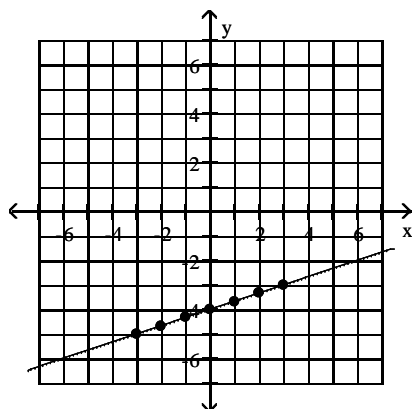function, or a quadratic function.**

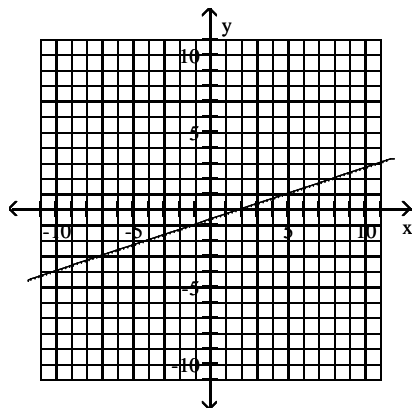17)   17) _____

x	y
0.6	3
1.5	4.2
2.2	4
3	2.5
4	0.5
2.7	3
3.5	1.5
0	2
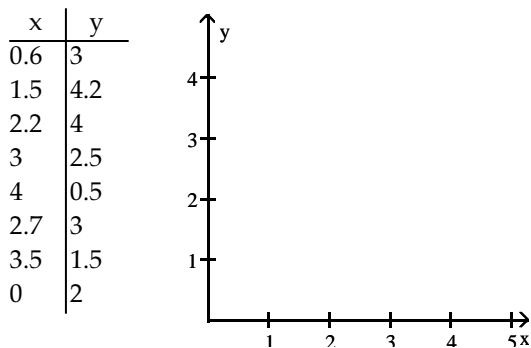
1) $3x^2 + 37x + 70$
2) $(x + 11)(x - 7)$
3) $(2x - 1)(3x - 3)$
4) $\{-3, 4\}$
5) $\{-5 - \sqrt{22}, -5 + \sqrt{22}\}$
6)

7)

8) 203.94

9) $\dfrac{3}{4}$, rises

10) a. $y = 6x + 46$
   b. 190

11) $C(x) = 0.09x + 39$; $53.40
12) $\{(-2, 0)\}$
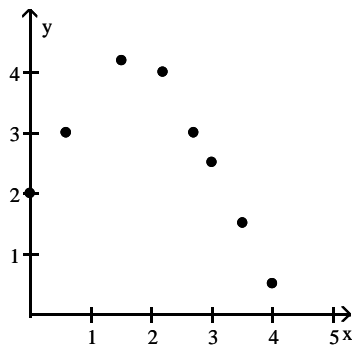13) $\{(4, 17)\}$
14) adult's ticket: $24; child's ticket: $20
15) a) 43.28 million; b) 71.393 million
16) 4.2

17)

quadratic function