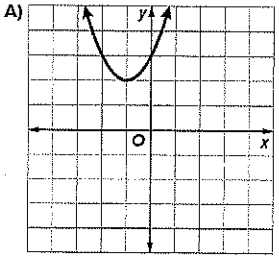
Student Name: _____ Date: _____

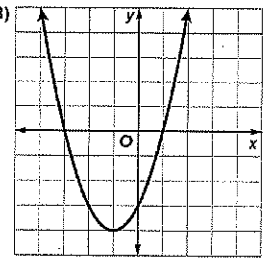
Module Review (RA2 M3)

1A) Which is the graph of $f(x) = -x^2 - 2x + 3$?

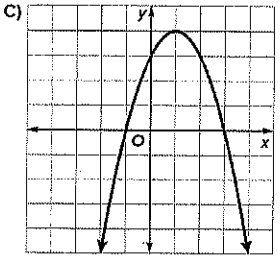
○ **A)**



○ **B)**



○ **C)**



○ **D)**

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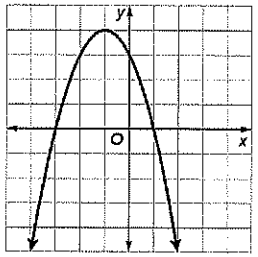
Module Review (RA2 M3)



1B) What are the domain and range of $f(x) = -x^2 - 2x + 3$?

○ **A)** $D = \{x | x \leq 4\}$
$R = \{\text{all real numbers}\}$

○ **B)** $D = \{x | x \leq 4\}$
$R = \{y | y \leq 4\}$

○ **C)** $D = \{\text{all real numbers}\}$
$R = \{y | y \leq 4\}$

○ **D)** $D = \{\text{all real numbers}\}$
$R = \{\text{all real numbers}\}$

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Module Review (RA2 M3)

2) At a concert, a T-shirt cannon launches a T-shirt upwards at a velocity of 90 feet per second. The height of the T-shirt seconds after launch is given in the table.

time (seconds)	height (feet)
1	74
2	116
3	126
4	104
5	50

Find and interpret the average rate of change between 1 and 3 seconds after launch.

_____

_____

_____

_____

_____

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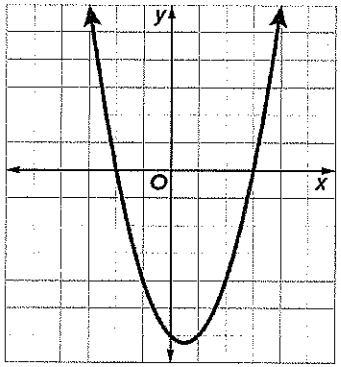
Module Review (RA2 M3)

3) The graph of $f(x) = x^2 - x - 6$ is shown.



Find the solutions of $x^2 - x - 6 = 0$. Select all that apply.

- ☐ **A)** 2
- ☐ **B)** 3
- ☐ **C)** –6
- ☐ **D)** –3
- ☐ **E)** 6
- ☐ **F)** –2

4) Use a quadratic equation to find two real numbers with a sum of 31 and a product of 210.

Two real numbers with a sum of 31 and a product of 210 are _____ and _____.

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Module Review (RA2 M3)

5) An object is dropped from a 100-foot tall building. The height of the object, in feet, after t seconds can be modeled by the function $h(t) = -16t^2 + 100$. How many seconds does it take the object to reach the ground?

- A) $\frac{5}{2}$
- B) $\frac{25}{4}$
- C) $\frac{25}{8}$
- D) $\frac{5}{8}$

6) Simplify.

$\sqrt{-9} \times \sqrt{-49}$

- A) $-21i$
- B) -21
- C) 21
- D) $21i$

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Module Review (RA2 M3)

7) Fill in the blanks using the available answer choices.

What are the solutions of the equation $x^2 + 9 = 0$?

$x =$ _____ (Blank 1) or $x =$ _____ (Blank 2)

Blank 1 options	Blank 2 options
• –9	• 3
• –9i	• 3i
• –3	• 9
• –3i	• 9i

8) Simplify.

$\frac{2+4i}{5i}$

- A) $\frac{4}{5} - \frac{2}{5}i$
- B) $-\frac{4}{5} + \frac{2}{5}i$
- C) $\frac{4}{5} + \frac{2}{5}i$
- D) $\frac{2}{5i} + \frac{4}{5}$

9) What is the voltage V of an electronic circuit with a current C of $3 + j$ and an impedance I of $5 - 2j$? Use the formula $V = CI$.

- A) $17 - 11j$
- B) $13 - j$
- C) $13 + 11j$
- D) $17 - j$

10) Fill in the blanks using the available answer choices.

Solve $4x^2 - 64 = 8x - 4$ by factoring.

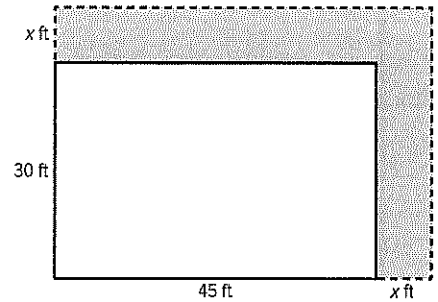
$x =$ _____ (Blank 1) or $x =$ _____ (Blank 2)

Blank 1 options	Blank 2 options
• −3	• 3
• −4	• 4
• −5	• 5

11) Solve $x^2 - 196 = 0$.

$x =$ _____ or $x =$ _____

12) A rectangular lawn has a width of 30 feet and a length of 45 feet.



A landscape designer wants to increase the length and width of the lawn by the same amount so that the total area will be 2200 square feet. By how many feet should the designer increase the length and width of the lawn?

- ○ **A)** 10 feet
- ○ **B)** 19 feet
- ○ **C)** 29 feet
- ○ **D)** 28 feet

13) Given that $y^{12} + 81 = (y^6 + m)(y^6 - m)$, what is the value of m?

$m =$ _____

14) Use the square root property to find all solutions of $x^2 + 10x + 25 = 81$. Select all that apply.

- ☐ **A)** –14
- ☐ **B)** 14
- ☐ **C)** 9
- ☐ **D)** –4
- ☐ **E)** 4
- ☐ **F)** –9

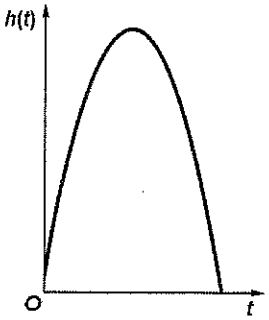
15) What value of c makes $x^2 + 16x + c$ a perfect square?

- ○ **A)** 64
- ○ **B)** 8
- ○ **C)** 256
- ○ **D)** 4

16) Solve $x^2 + 24x + 150 = 0$ by completing the square.

- ○ **A)** $12 \pm \sqrt{6}$
- ○ **B)** $12 \pm i\sqrt{6}$
- ○ **C)** $-12 \pm \sqrt{6}$
- ○ **D)** $-12 \pm i\sqrt{6}$

17) A baseball is hit straight upwards with a velocity of 96 feet per second. The height of the baseball, in feet, at time t seconds after being hit is modeled by the function $h(t) = -16t^2 + 96t + 3$.



Complete the square to find the baseball's maximum height and at what time t the maximum height is reached.

maximum height: _____ feet
time maximum reached: _____ seconds

18) Solve $4x^2 - 6x - 5 = 0$ by using the quadratic formula.

- ○ **A)** $\frac{3 \pm \sqrt{29}}{4}$
- ○ **B)** $\frac{3 \pm \sqrt{11}}{4}$
- ○ **C)** $\frac{-3 \pm \sqrt{11}}{4}$
- ○ **D)** $\frac{-3 \pm \sqrt{29}}{4}$

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Module Review (RA2 M3)

19) Fill in the blanks using the available answer choices.

Find the value of the discriminant, and then describe the number and type of roots of the equation $3x^2 - 5x + 6 = 0$.

The value of the discriminant is _____ (Blank 1), so the equation has two _____ (Blank 2) solutions.

Blank 1 options	Blank 2 options
• –97	• complex
• –47	• irrational
• 97	• rational

20) Some fireworks displays can reach heights of over 300 meters. The height of a firework shell, in meters, t seconds after launch can be modeled by the function $f(t) = -4.9t^2 + 80t$. How many seconds does it take for the shell to first reach a height of 300 meters? Round to the nearest tenth of a second.

_____ seconds