

Final Exam this Thurs-Fri (15% of your grade)


All quiz/test retakes due TOMORROW by 3:15 pm


Tutoring M-Th 3-4:15 Room 208

WHITEBOARDS

Simplify

$$14 \cdot 3\sqrt{196}$$





Factor

$$x^2 + 8x - 20$$

$$(x+10)(x-2)$$

$$\begin{array}{r} -20 \\ 10 \quad -2 \\ +8 \end{array}$$

A shot-put throw can be modeled using the equation $y = -0.0241x^2 + x + 5.5$ where x is horizontal distance traveled in feet, and y is the height in feet.

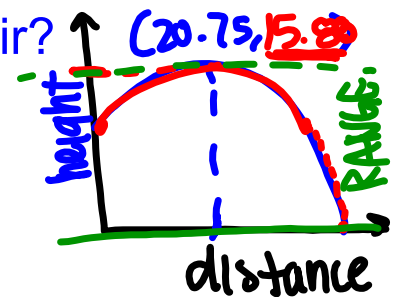
(distance, height)

A - How high did the shot-put go in the air?

$$\frac{-1}{2(-0.0241)} = (20.75, 15.88) \text{ Ft}$$

B - Give a realistic range

$$[0, 15.9]$$



Find an expression that represents the area of the rectangle

$$\begin{array}{r|l} 4x + 3 = l & \\ \hline 8x^2 & 6x \\ \hline -8x & -6 \end{array} \begin{array}{l} 2x \\ 2x - 2 = w \\ -2 \end{array}$$

$$A = l \cdot w$$

$$8x^2 - 2x - 6$$

Factor

$$(2a^3 + 10a^2 + 7a + 35)$$

$$2a^2(a+5) + 7(a+5)$$

$$(2a^2 + 7)(a+5)$$

	$a + 5$	
$2a^2$	$2a^3$	$+10a^2$
$+7$	$+7a$	$+35$

Simplify

$$\left(\frac{16a}{b}\right)^{\frac{3}{4}}$$
$$\frac{16^{\frac{3}{4}} a^{\frac{3}{4}}}{b^{\frac{3}{4}}}$$
$$\frac{8a^{\frac{3}{4}}}{b^{\frac{3}{4}}}$$

.. -

Find the average rate of change of the function $f(x) = 3x^2 + 2x$ over the interval $[1, 4]$

$$\frac{f(4) - f(1)}{4 - 1} = \frac{56 - 5}{3} = \frac{51}{3} = 17$$

$$f(4) = 3 \cdot 4^2 + 2(4) = 56$$

$$f(1) = 3 \cdot 1^2 + 2(1) = 5$$

Find the x-intercepts

$$x^2 - 10x + 16 = 0 \quad x = 2, 8$$

$$(x-2)(x-8) = 0$$

$$\begin{array}{l} x-2 = 0 \\ \quad \quad \quad \rightarrow \\ \quad \quad \quad +2 \\ \quad \quad \quad \rightarrow \\ x = 2 \end{array}$$

$$\begin{array}{l} x-8 = 0 \\ \quad \quad \quad \rightarrow \\ \quad \quad \quad +8 \\ \quad \quad \quad \rightarrow \\ x = 8 \end{array}$$

Solve for x

$$(x - 3)^2 - 10 = 15$$

+10 +10

$$(x-3)(x-3)$$

$$x^2 - 6x + 9 - 10 = 15$$

$$\sqrt{(x-3)^2} = \sqrt{25}$$

$$x - 3 = \pm 5 + 3$$

+3

$$x = 8, -2$$

Simplify

$$\sqrt{-32}$$

Handwritten work in green ink showing the simplification process:

- A green arrow points from the radical symbol to the number 4 in the expression $4\sqrt{2}$.
- A green arrow points from the number 4 in $4\sqrt{2}$ to the number 4 in the radicand of $\sqrt{-32}$.
- A green arrow points from the number 2 in $4\sqrt{2}$ to the number 2 in the radicand of $\sqrt{-32}$.
- The number 2 in the radicand of $\sqrt{-32}$ is circled in green.
- The number 4 in the radicand of $\sqrt{-32}$ is circled in green.
- The number 2 in the radicand of $\sqrt{-32}$ is crossed out with a dashed line.

Solve the system of equations

$$y = x - 2$$

"y" $y = -x^2 + 2x$

$$(2, 0)$$

$$(-1, -3)$$

$$x - 2 = -x^2 + 2x$$

$$x^2 - 1x - 2 = 0$$

$$(x - 2)(x + 1) = 0$$

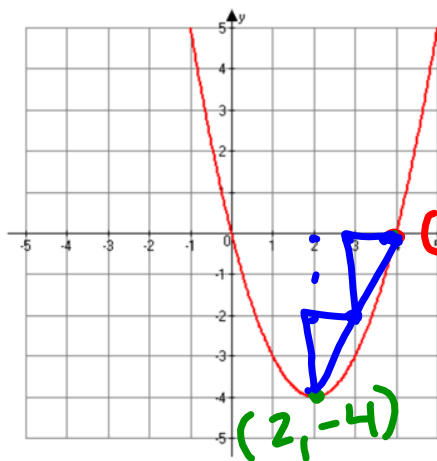
$$x - 2 = 0 \quad x + 1 = 0$$

$$x = 2$$

$$x = -1$$

Find the average rate of change over the given interval

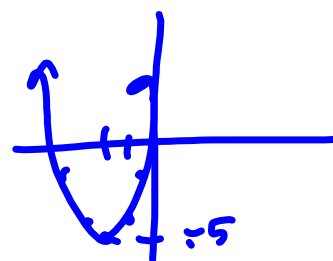
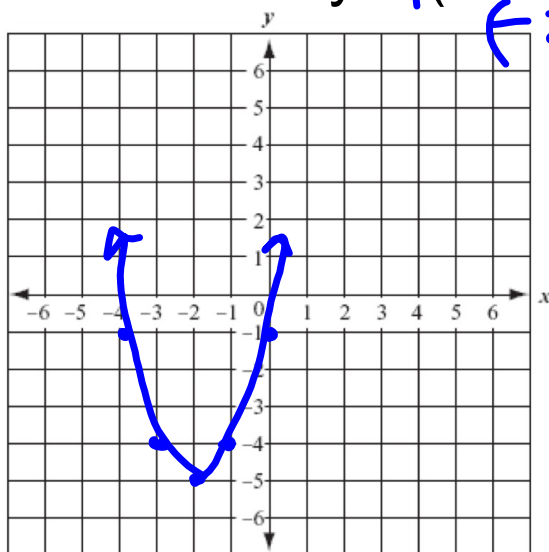
$[2, 4]$



$$\frac{f(4) - f(2)}{4 - 2} = \frac{0 - (-4)}{2} = \frac{4}{2} = 2$$

$$\frac{4}{2} = 2$$

Graph the function $y = |(x + 2)^2 - 5|$ ←
(-2, -5)



Simplify

$$\frac{2x^{\frac{3}{2}}}{xy^{-1}}$$

Find the vertex and y-intercept of the function

$$\begin{array}{l}
 a = -1 \\
 b = 1 \\
 c = 12 \\
 \text{Vertex:} \\
 \frac{-b}{2a} = \frac{-1}{2(-1)} = \frac{-1}{-2} = \frac{1}{2}, \quad 12.25 \quad 12 \frac{1}{4} \\
 \text{y-intercept} \quad (0, 12)
 \end{array}$$

$y = -x^2 + 1x + 12$
 $-\left(\frac{1}{2}\right)^2 + \frac{1}{2} + 12$

What are the x-intercepts of the function
 $y = (x - 1)(x + 3)$

Write a quadratic function with solutions of
 $x = -4$ and $x = \frac{3}{4}$ in standard form

Find the product
 $(2x - 1)^2$

Math 2A Practice Final Multiple Choice

Name _____

Test Review due tomorrow

Write in radical form

- 1) $(4x)^{\frac{2}{3}}$
 A) $4\sqrt[3]{x^2}$ B) $(\sqrt{4x})^3$
 C) $(\sqrt[3]{4x})^2$ D) $\sqrt{4x}$

Write in exponential form.

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

Simplify.

3) $3x^{\frac{3}{2}} \cdot 3x^{\frac{2}{3}}$

- A) $3x$ B) $6x^{\frac{3}{2}}$
 C) $9x^{\frac{13}{6}}$ D) $3x^{\frac{13}{6}}$

5) $(64m^6)^{\frac{3}{2}}$

- A) $64m^9$ B) $512m^9$
 C) $8m^2$ D) $512m^{\frac{15}{2}}$

7) $\frac{4m^{-\frac{2}{3}}}{m^{\frac{1}{2}}}$

- A) $\frac{4}{m^{\frac{1}{6}}}$ B) $4m^{\frac{7}{6}}$
 C) $\frac{4}{m^{\frac{7}{6}}}$ D) $\frac{1}{4m^{\frac{7}{6}}}$

4) $3x^0 x^{\frac{1}{3}}$

- A) 3 B) $3x$
 C) 1 D) $3x^{\frac{1}{3}}$

6) $\frac{4xy^{-2}}{2xy^{\frac{5}{3}}}$

- A) $2x^2 y^{\frac{1}{3}}$ B) $\frac{2}{y^3}$
 C) $\frac{2}{y^3}$ D) $\frac{2x^2}{y^3}$

8) $\left(\frac{x^{\frac{7}{4}} y^{\frac{3}{2}}}{y^2}\right)^{\frac{1}{3}}$

- A) $x^{\frac{7}{12}} y^{\frac{1}{6}}$ B) $\frac{11}{x^{\frac{8}{7}} y^{\frac{11}{3}}}$
 C) $x^2 \cdot y^3$ D) $y^{\frac{3}{2}} x^{\frac{11}{3}}$

9) $\left(xy^{\frac{5}{3}}\right)^{\frac{2}{3}}$

A) $y^4x^{\frac{10}{3}}$ B) $x^3y^{\frac{3}{2}}$
 C) $x^3y^{\frac{10}{9}}$ D) y^4

Find each product.

- 10) $(3v + 6)(6v^2 - 7v - 8)$
 A) $18v^3 + 15v^2 - 66v - 48$
 B) $20v^3 + 56v^2 + 44v + 24$
 C) $18v^3 - 21v^2 - 30v - 48$
 D) $6v^2 - 4v - 2$
- 11) $(5n + 1)^2$
 A) $25n^2 - 1$
 B) $25n^2 + 1$
 C) $n^2 - 16$
 D) $25n^2 + 10n + 1$
- 12) $(4n - 6)(4n + 6)$
 A) $16n^2 + 48n + 36$
 B) $16n^2 - 48n + 36$
 C) $n^2 - 16n + 64$
 D) $16n^2 - 36$
- 13) $(2n - 3)(3n + 1)$
 A) $6n^2 - 7n - 3$
 B) $6n^2 + 11n + 3$
 C) $6n^2 + 5n - 25$
 D) $3n^2 - 8n + 5$

Factor.

- 14) $4k^2 + 16k - 240$
 A) $4(k + 20)(k - 3)$
 B) $4(k - 6)(k + 10)$
 C) $4(k - 6)(k - 10)$
 D) $4(k + 6)(k - 10)$
- 15) $m^2 - 25$
 A) Not factorable
 B) $(m - 5)(m - 5)$
 C) $(m + 5)(m - 5)$
 D) $(m + 25)^2$
- 16) $k^2 - 7k - 30$
 A) $(k + 10)(k + 3)$
 B) $(k - 10)(k + 3)$
 C) $(k - 10)(k - 3)$
 D) $(k + 30)(k - 1)$
- 17) $6n^3 + 21n^2 - 10n - 35$
 A) $(3n^2 - 5)(3n^2 - 7)$
 B) $(3n^2 - 5)(2n + 7)$
 C) $(3n^2 + 5)(2n - 7)$
 D) $(2n - 5)(3n^2 + 7)$
- 18) $5n^2 - 21n + 4$
 A) $(5n + 4)(n + 1)$
 B) $5(n - 1)(n + 4)$
 C) $(5n - 1)(n - 4)$
 D) $(5n + 2)(n + 2)$
- 19) $2n^3 - 23n^2 + 56n$
 A) Not factorable
 B) $2n(n + 1)(n + 28)$
 C) $n(2n - 7)(n - 8)$
 D) $2n(n - 7)(n + 8)$

Find the x intercepts.

- 20) $x^2 - 2x - 15 = 0$
 A) $\{-3, 5\}$ B) $\{3, -5\}$
 C) $\{-7, 5\}$ D) $\{-2\}$

Solve each equation.

21) $4n^2 + 20n = 0$

- A) $\{5, 0\}$ B) $\{-5, 0\}$
 C) $\{7, 0\}$ D) $\{4, 0\}$

23) $12x^2 - 9x = -12$

- A) $\left\{ \frac{3+i\sqrt{7}}{8}, \frac{3-i\sqrt{7}}{8} \right\}$
 B) $\left\{ \frac{3+\sqrt{73}}{8}, \frac{3-\sqrt{73}}{8} \right\}$
 C) $\left\{ \frac{3+i\sqrt{55}}{8}, \frac{3-i\sqrt{55}}{8} \right\}$
 D) $\left\{ \frac{-3+\sqrt{73}}{8}, \frac{-3-\sqrt{73}}{8} \right\}$

Simplify.

25) $\sqrt{-48}$

- A) -24 B) $-4\sqrt{3}$
 C) $4i\sqrt{3}$ D) $4i$

Solve each system of equations.

27) $y = x^2 - x - 6$
 $-2x + y = -2$

- A) $(1, -6), (-4, 24)$
 B) $(-1, -4), (4, 6)$
 C) $(4, -1)$
 D) $(-4, 1)$

Simplify.

29) $(2 - i) - (2 + 6i)$

- A) $2 - i$ B) $-7i$
 C) $-4 - 5i$ D) $-1 - 6i$

31) $(3 + 2i)(8 - 4i)$

- A) $16 - 28i$ B) $32 - 4i$
 C) $9 + 6i$ D) $32 + 4i$

22) $(x + 3)^2 + 10 = 59$

- A) $\{4, -4\}$ B) $\{-10, 4\}$
 C) $\{\sqrt{69}\}$ D) $\{7, -7\}$

24) $2p^2 + 2p - 3 = 0$

- A) $\left\{ \frac{-7 + \sqrt{469}}{14}, \frac{-7 - \sqrt{469}}{14} \right\}$
 B) $\left\{ \frac{-1 + \sqrt{7}}{2}, \frac{-1 - \sqrt{7}}{2} \right\}$
 C) $\left\{ \frac{7 + \sqrt{469}}{14}, \frac{7 - \sqrt{469}}{14} \right\}$
 D) $\left\{ \frac{7 + \sqrt{154}}{14}, \frac{7 - \sqrt{154}}{14} \right\}$

26) $2\sqrt{63}$

- A) $12\sqrt{5}$ B) $9\sqrt{3}$
 C) $6\sqrt{7}$ D) $56\sqrt{7}$

28) $x^2 + y^2 - 8 = 0$
 $x + y = 4$

- A) $(2, 2)$
 B) $(2, 2), (2, 5)$
 C) $(2, 5), (-4, 6)$
 D) $(-4, 6)$

30) $(8 - i) + (1 + 2i)$

- A) 17 B) $9 + i$
 C) $9 - i$ D) $-9 + 3i$

32) $(-1 + 7i)^2$

- A) 64 B) $-48 + 14i$
 C) 49 D) $-48 - 14i$

Find the vertex for the Quadratic Function

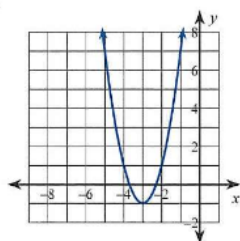
33) $y = 2x^2 + 4x + 3$

34) $y = -x^2 + 2x - 4$

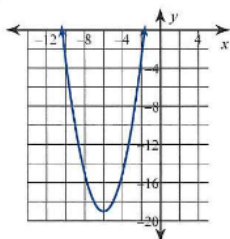
Sketch the graph of each function.

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

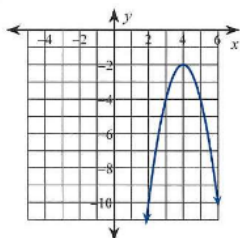
A)



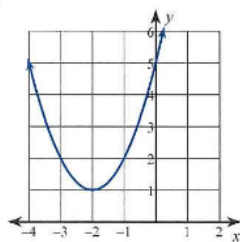
B)



C)



D)



Math 2 Practice Final: Free Response

Name: _____

Hour: _____

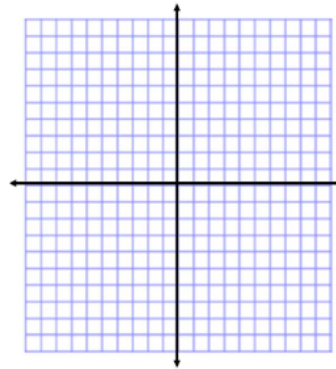
Read all instructions completely. Show all of your work. No points will be given without appropriate work being shown and answers indicated.

Solve the following system of equations, show all your work.

$y = -x^2 - 5$

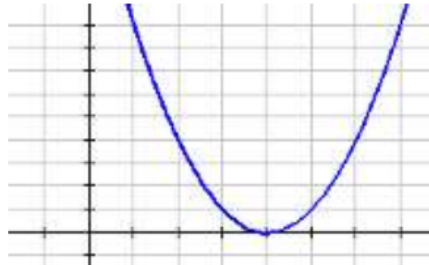
$y = x^2 + 10x + 3$

(use the graph if you would like)

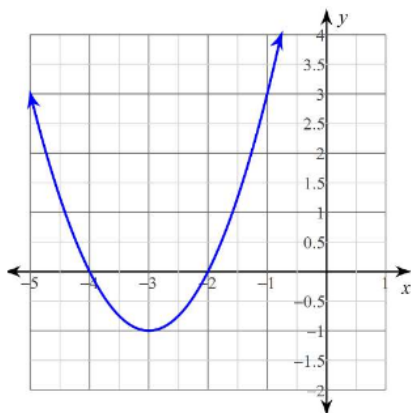


- Given the equation: $f(x) = -3x^2 + 5$ Find the average rate of change over the interval $[-1, 3]$:

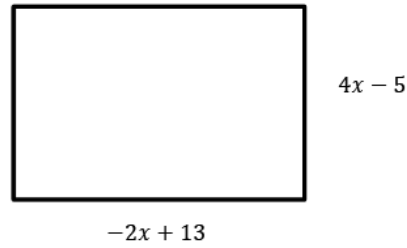
- Given the following graph, find the average rate of change over the interval $[2, 5]$



4. Write a quadratic equation given the graph below.



- . Given the following rectangle, calculate the area of the rectangle:



Write a quadratic function that fits the given criteria.

- . Vertex at $(2, -3)$ through $(0, -7)$, written in vertex form:

- . Solution at $x = -4$ and $x = \frac{2}{3}$, written in standard form:

- . If a football is kicked straight upward, then the height $h(t)$ of the football in feet at time t in seconds is given by

$$h(t) = -16t^2 + 64t + 10.$$

- a) What is the height of the football 4 seconds after it is kicked?

- b) How long does it take for the football to return to earth (round to the nearest hundredth)?

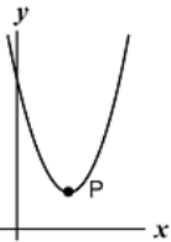
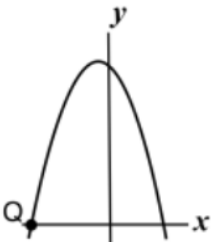
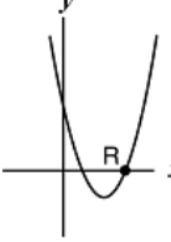
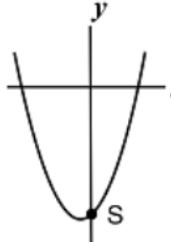
- c) How long does it take to reach the maximum height?

- d) What is the maximum height?

- e) What is the real world domain of the function?

- f) What is the real world range of the function?

9. Here are four equations of quadratic functions and four sketches of quadratic graphs.

<p>A. $y = x^2 - 6x + 8$</p>	<p>B. $y = (x - 6)(x + 8)$</p>	<p>C. $y = (x - 6)^2 + 8$</p>	<p>D. $y = -(x + 8)(x - 6)$</p>
<p>A.</p> 	<p>B.</p> 	<p>C.</p> 	<p>D.</p> 

Match the equation to its graph and explain your decision.

Equation A **matches** Graph _____, because _____

Equation B **matches** Graph _____, because _____

Equation C **matches** Graph _____, because _____

Equation D **matches** Graph _____, because _____

10. Write the coordinates of the points:

$P(\quad , \quad)$ $Q(\quad , \quad)$ $R(\quad , \quad)$ $S(\quad , \quad)$