Autumn 2018

Form C

Name: _____

Signature: _____

OSU name.#: _____

Lecturer: _____

Recitation Instructor: _____

Recitation Time: _____

MATH 1075 Final Exam

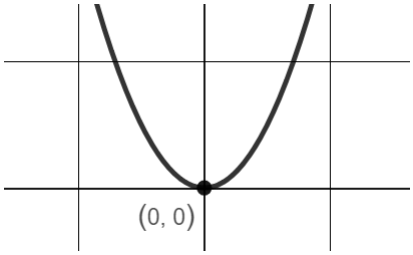
Instructions:

- You will have 1 hour and 45 minutes to take the exam.
- Show ALL work to receive full credit. Answers with insufficient supporting work will receive little or no credit.
- Write clearly and legibly. Illegible answers and ambiguous markings will not receive credit.
- Completely simplify all answers.
- Please CIRCLE your answers.

Page:	2	3	4	5	6	7	8	9	10	11	Total
Points:	12	30	29	18	18	22	13	12	16	15	185
Score:											

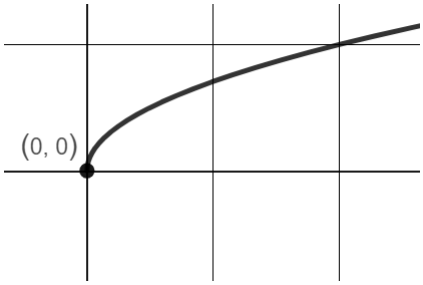
1. (12 points) Draw arrows to match the graph of each function on the left with its corresponding function type on the right.

(A)



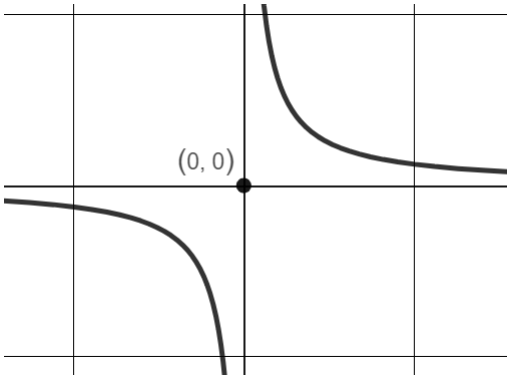
(a) Absolute Value

(B)



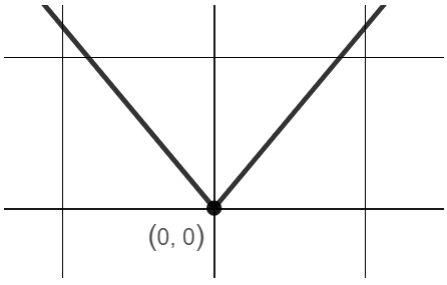
(b) Quadratic

(C)



(c) Reciprocal

(D)



(d) Square Root

2. (30 points) Factor each expression as much as possible. If an expression is prime, write "prime."

(a) $7w^3 + 4w^2 + 21w + 12$

(b) $625x^4 - 81$

(c) $27w^3 + 125$

(d) $6x^2 - 19x + 3$

3. (21 points) Solve each inequality. Write each solution set in interval notation.

   (a) $6x + 6 < 18 \quad$ or $\quad 4x - 4 \geq 16$

   (b) $|2u + 7| \geq 3$

4. (8 points) Debbie drove 416 miles in 6 hours. At the same rate, how far could she drive in 14 hours?

5. (18 points) Solve each quadratic equation algebraically. You may use any of these methods: the Zero Product Rule, completing the square and using the Square Root Property, or the Quadratic Formula.

   (a) $u^2 + 11u + 24 = 0$

   (b) $(v + 14)^2 - 20 = 0$

   (c) $6w^2 - 13w - 7 = 0$

6. (11 points) Let $f(x) = x^2 + 28x + 41$

   (a) Does the function have a maximum value or a minimum value?

   (b) At which x-value does the function's maximum or minimum value occur?

   (c) What is the function's maximum or minimum value?

7. (7 points) Consider $y = -4(x - 47)(x + 18)$

   (a) What are the x-intercepts of the parabola?

   (b) What is the y-intercept of the parabola?

8. (10 points) Simplify as much as possible.

$$\frac{3x}{2x+5} \div \frac{30x}{4x+10}$$

9. (12 points) Subtract and simplify as much as possible.

$$\frac{5}{x^2-8x-20} - \frac{4}{x-10}$$

10. (13 points) CHOOSE ONE of the following problems to solve. Cross out (with a large X) the problem that you chose not to solve.

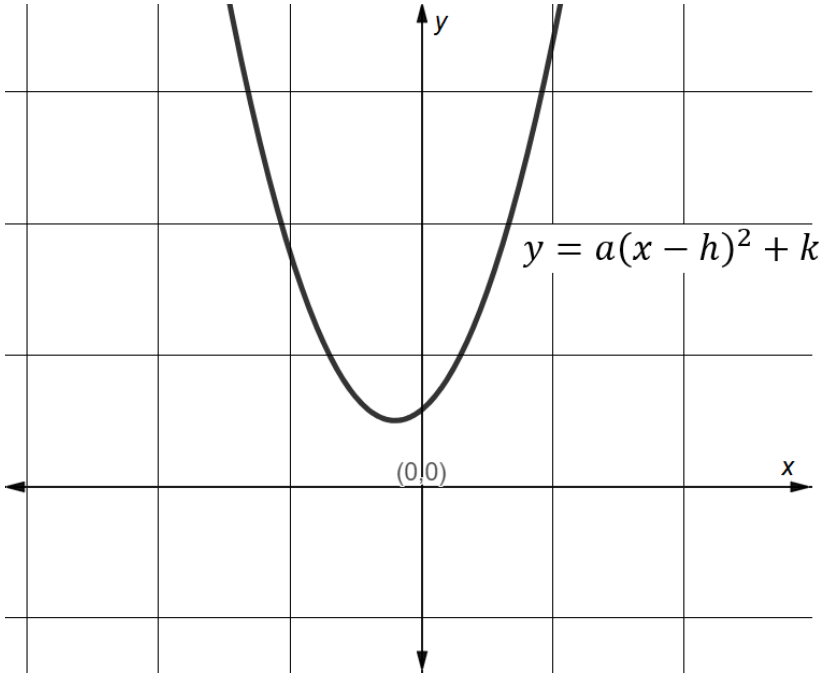
(a) OPTION A.
Solve for y, where y is a real number.

$$\sqrt{-4y+1}+\sqrt{2y+4}=3$$

(b) OPTION B.
A plane has a cruising speed of 200 miles per hour when there is no wind. At this speed, the plane flew 400 miles with the wind in the same amount of time it flew 225 miles against the wind. Find the speed of the wind.

Use the space below to solve the problem that you have chosen.

11. (12 points) Below you are shown the graph of a quadratic function. The origin $(0, 0)$ is also shown on the graph.



Suppose this function has been written in vertex form $y = a(x - h)^2 + k$, for real numbers a, h, and k.

(a) Circle the correct statement regarding the value a.

A. $a > 0$ because the quadratic is opening upward
B. $a > 0$ because the vertex is above the origin
C. $a < 0$ because the vertex is to the left of the origin
D. $a = 0$ because there are no numbers on the coordinate axes

(b) Circle the correct statement regarding the value h

A. $h > 0$ because the quadratic is opening upward
B. $h = 0$ because the quadratic does not have a vertex
C. $h < 0$ because the vertex is to the left of the origin
D. $h < 0$ because the vertex is above the origin

(c) Circle the correct statement regarding the value k.

A. $k > 0$ because the vertex is above the origin
B. $k = 0$ because the quadratic does not have a vertex
C. $k < 0$ because the quadratic is opening upward
D. $k < 0$ because the vertex is to the left of the origin

12. (4 points) Simplify $\left(\frac{1}{64}\right)^{-\frac{3}{2}}$. Circle your answer from among the options below.

A. $-3/128$

B. $-2/192$

C. 512

D. $1/512$

E. None of the above.

13. (4 points) Which of the following is the domain of $f(x) = \dfrac{4x-1}{(8x-2)(x-1)}$? Circle the correct answer.

A. $(-\infty, 1) \cup (1, \infty)$

B. $(-\infty, \infty)$

C. $(-\infty, 1/4) \cup (1/4, 1) \cup (1, \infty)$

D. $\varnothing$

E. None of the above.

14. (4 points) Simplify the expression $\sqrt{16x+9} - \sqrt{144x+81}$. Circle your answer from among the choices below.

A. $-8x - 6$

B. -14

C. $-2\sqrt{16x+9}$

D. $-8\sqrt{x} - 6$

E. None of the above.

15. (4 points) Consider the following variation relationship.

T varies jointly with the cube of P and the square root of M.

Circle the equation from among the choices below that models this relationship. The letter k denotes the constant of proportionality.

A. $T = kP^3M^2$

B. $T = kP^3 + k\sqrt{M}$

C. $T = \dfrac{P^3}{\sqrt{M}}$

D. $T = kP^3\sqrt{M}$

E. None of the above.

16. (15 points) **True or False?** Circle "True" if the statement is true; circle "False" if the statement is false.

(a) True False The equation $x^2 = 64$ has only one solution: $x = 8$

(b) True False The relation $\{(a,1),(b,2),(c,3),(d,3)\}$ is a function.

(c) True False The equation $|x-1| = 5$ has solution set $\{-4,6\}$.

(d) True False If $x(x+8) = 4$, then by the Zero Product Rule, $x = 4$ or $x+8 = 4$.

(e) True False $\dfrac{7x+1}{2x+1}$ <u>cannot</u> be simplified to $\dfrac{7}{2}$.

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Nothing on this page will be graded, but you may use it as scratch paper.