Directions:

- This is a two hour exam. Clearly print your name on the first page and the top of the third page (second piece of paper). No books, notes, internet connection, or cell phone can be used during this exam. Any scratch paper must be provided to you by the proctor and turned in with the exam. A calculator maybe used; however, the calculator cannot have a Computer Algebra System (CAS) or a QWERTY keyboard. When you have completed the exam:
  1) Turn in the entire exam (including cover page, and any scratch papers) to the proctor
  2) Show your ID to the proctor
  3) Sign the "Sign Out Sheet"
- All answers must be fully filled in on the front page, like so:

  (A) (B) (C) (D) (E)
- The exam is out of 100 total points (5 points for each of the 20 questions). Only this front page will be graded and no partial credit will be awarded. Consequently, please double check to make sure that you have marked the answer you desire. Good Luck!

#1 (A) (B) (C) (D) (E)

#2 (A) (B) (C) (D) (E)

#3 (A) (B) (C) (D) (E)

#4 (A) (B) (C) (D) (E)

#5 (A) (B) (C) (D) (E)

#6 (A) (B) (C) (D) (E)

#7 (A) (B) (C) (D) (E)

#8 (A) (B) (C) (D) (E)

#9 (A) (B) (C) (D) (E)

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#17 (A) (B) (C) (D) (E)

#18 (A) (B) (C) (D) (E)

#19 (A) (B) (C) (D) (E)

#20 (A) (B) (C) (D) (E)

Name (Print):______________________________

Section Number:______________________________

Section	Instructor	Class Start Time	Exam Location
001	Drew Butcher	MWF 8:00 AM	MEH
002	Konstantina Christodoulopoulou	MWF 9:00 AM	CB 106
003	Konstantina Christodoulopoulou	MWF 2:00 PM	CB 118
004	Drew Butcher	MWF 11:00 AM	MEH
005	Drew Butcher	MWF 3:00 PM	MEH (A-K) & CP 320 (L-Z)
006	Jonathan Constable	TR 8:00 AM	CB 102
007	Stephen Deterding	TR 8:00 AM	CB 110
008	Jonathan Constable	TR 9:30 AM	CB 102
009	Stephen Deterding	TR 9:30 AM	CB 110
010	Michael Gustin	TR 11:00 AM	CB 114
011	Robert Davis	TR 11:00 AM	CB 122
012	Michael Gustin	TR 12:30 PM	CB 114
013	Robert Davis	TR 12:30 PM	CB 122
014	Ray Kremer	TR 2:00 PM	CP 139
015	Clinton Hines	TR 2:00 PM	CP 139
016	Ray Kremer	TR 3:30 PM	CP 139
017	Clinton Hines	TR 3:30 PM	CP 139

UK: "Go CATS" Name:______________________________ Section:________

1. (5 points) Let $f(x) = 2x - 5$. What is $f(3x + 1)$?

   A. $3x + 1$

   B. $6x - 14$

   C. $2x + 1$

   D. $6x - 3$

   E. None of the above

2. (5 points) Express algebraically the following geometric statement:

   The distance from y to -3 is less than or equal to 42 units.

   A. $|y - 3| > 42$

   B. $|y + 3| \leq 42$

   C. $|y - 42| > -3$

   D. $|y - 42| < 3$

   E. $|3 - y| < 42$

3. (5 points) Use the intersection method or the intercept method to approximate the solution of $7x^2 - 5x + 3 = 2x^2 + 2x + 7$ in the interval $(0, 2)$. The solution is approximately...

   A. 1.8

   B. 1.3

   C. 0.8

   D. 0.4

   E. No solution

4. (5 points) A scientist has two large containers of hydrochloric acid solutions of differing concentrations. The scientist mixes 500 mL of the first with 400 mL of the second to produce a 35% acid solution. He then mixes 200 mL of the first with 800 mL of the second to produce a 50% acid solution. Approximately, what is the acid concentration of the first container (round to 2 decimal places as a percentage)?

   A. The first container is a 68.75% acid solution.

   B. The first container is a 58.44% acid solution.

   C. The first container is a 0.03% acid solution.

   D. The first container is a 16.25% acid solution.

   E. None of the above or the solution does not exist.

5. (5 points) A circular concrete walkway of uniform width is to be built surrounding a circular hot tub. The radius of the hot tub is 4 feet, and enough concrete is available to cover 48π square feet. If all the concrete is to be used, how wide should the walk be? Hint: recall the area of a circle is $A = \pi r^2$.

   A. 5 feet

   B. 2 feet

   C. 3 feet

   D. 4 feet

   E. None of the above.

6. (5 points) The perimeter of a rectangle is 34 centimeters and its area is 60 square centimeters. Approximately, what are the dimensions of the rectangle (within 0.1%)?

   A. 1.18 cm by 28.82 cm

   B. 1.87 cm by 32.13 cm

   C. 34 cm by 60 cm

   D. 5 cm by 12 cm

   E. None of the above or no such rectangle exists.

7. (5 points) Solve the inequality and express your answer in interval notation

$$|2x + 1| < 3$$

   A. $(-2, 1)$

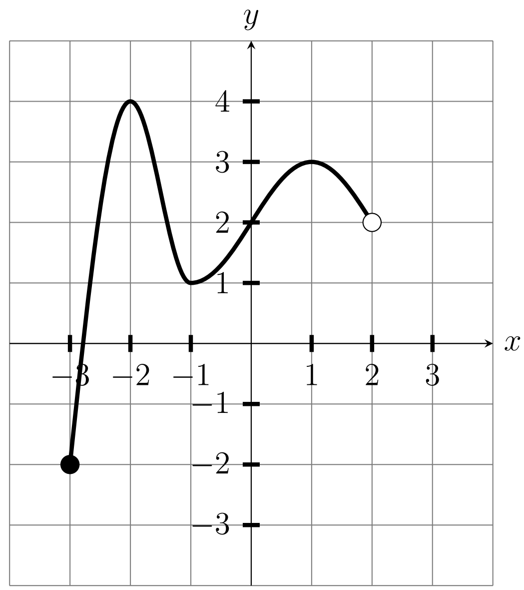
   B. $(-\infty, -2) \cup (1, \infty)$

   C. $[-2, 1]$

   D. $(-\infty, -2] \cup [1, \infty)$

   E. None of the above

8. (5 points) Find the range of the below function



A. $[-3, 2)$
B. $[-2, 4)$
C. $[-2, 4]$
D. $[-2, 2)$
E. None of the above

9. (5 points) Solve the following inequality:

$$x^2 + 2x - 15 < 0.$$

A. $(-5, -3)$
B. $[-5, 3]$
C. $(-5, 3)$
D. $(-3, 5)$
E. $(-\infty, -5) \cup (3, \infty)$

10. (5 points) Find all solutions to the following system of equations:

$$\begin{aligned} 3x - y &= -5 \\ xy &= 2 \end{aligned}$$

A. $(-2,-1)$
B. $(6, \frac{1}{3})$
C. $(-2,-1)$ and $(\frac{1}{3}, 6)$
D. $(-1,-2)$ and $(6, \frac{1}{3})$
E. None; the system is inconsistent

11. (5 points) Consider the system of equations:

$$3x - 5y = 18$$
$$8x + 7y = -13$$

Which of the following would result in an elimination of the variable x when the two equations are added together?

A. Multiplying the first equation by 7 and the second equation by 5.
B. Multiplying the first equation by -7 and the second equation by 5.
C. Multiplying the first equation by 8 and the second equation by 3.
D. Multiplying the first equation by -8 and the second equation by 3.
E. None of the above

12. (5 points) Solve the inequality and express your answer in interval notation

$$5x + 3 \leq 2x + 7$$

A. $\left(-\infty, \dfrac{4}{3}\right)$
B. $\left(-\infty, -\dfrac{4}{3}\right]$
C. $\left(-\infty, \dfrac{3}{4}\right]$
D. $\left(-\infty, \dfrac{4}{3}\right]$
E. $\left[\dfrac{4}{3}, \infty\right)$

13. (5 points) Find the domain of the function

$$f(x) = \frac{1}{x-8}$$

A. $(-\infty, 8) \cup (8, \infty)$
B. $(-\infty, 8)$
C. $(8, \infty)$
D. $(-\infty, \infty)$
E. None of the above

14. (5 points) Solve the inequality and express your answer in interval notation

$$\frac{2x^2 + x - 1}{x^2 - 4x + 4} \geq 0$$

A. $(-\infty, -1] \cup \left[\frac{1}{2}, \infty\right)$
B. $\left[-1, \frac{1}{2}\right]$
C. $(-\infty, -1] \cup \left[\frac{1}{2}, 2\right) \cup (2, \infty)$
D. $(-\infty, -1) \cup \left(\frac{1}{2}, \infty\right)$
E. $\left(-1, \frac{1}{2}\right)$

15. (5 points) Which of the following tables can **not** represent the values of a function?

A.

Input	1	2	3
Output	5	6	7

B.

Input	1	2	3
Output	5	6	5

C.

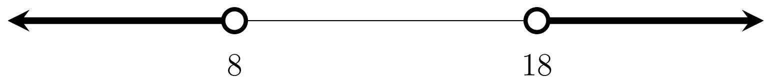
Input	-1	2	1
Output	5	6	7

D.

Input	1	2	1
Output	5	6	7

E. All of the above could describe functions

16. (5 points) Which algebraic statement represents the following graph?



A. $|x - 13| = 5$

B. $|13 + x| < 5$

C. $|13 - x| > -5$

D. $|x - 13| \leq 5$

E. $|x - 13| > 5$

17. (5 points) Let $f(x) = 2x^2 - 3$. What is $\dfrac{f(x+h) - f(x)}{h}$?

A. $4x$

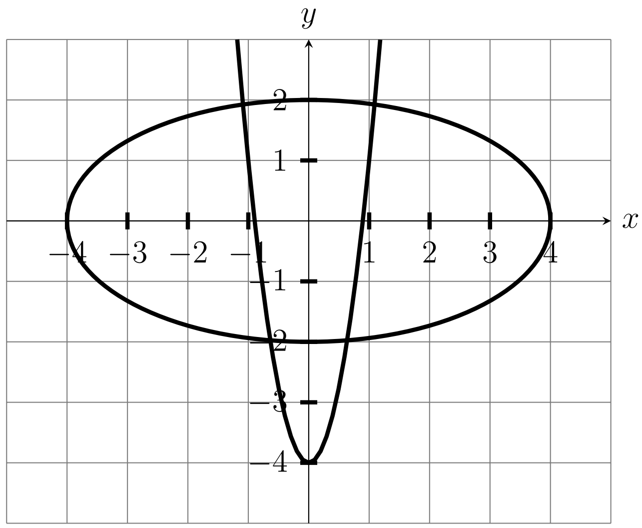
B. $\dfrac{4xh + h^2 + 10}{h}$

C. $2x + h$

D. $4x + 2h$

E. None of the above

18. (5 points) How many solutions are there to the system of equations whose graphs are shown below:



A. 0
B. 1
C. 2
D. 3
E. 4

19. (5 points) Consider the piecewise function

$$f(x) = \begin{cases} x^3 + 11 & \text{if } x \leq 2 \\ 2x^2 - 9 & \text{if } x > 2 \end{cases}$$

What is $f(1) + f(3)$?

A. 50
B. 7
C. 31
D. 21
E. None of the above

20. (5 points) The highest point on the graph of $y = 2x^3 - 9x + 4$ in the interval $(-2, 2)$ occurs at approximately which of the following points?

A. (-1.9,12.1)
B. (-1.2,11.3)
C. (0,5)
D. (1,10)
E. (1.5, -1)