Ma 110 — Precalculus Exam 1 Spring 2015 10 January 2015

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This exam has ten multiple choice questions (four points each) and five free response questions (seven points each). Additional blank sheets are available if necessary for scratch work. No books or notes may be used. Turn off your cell phones and do not wear ear-plugs during the exam. You may use a calculator, but not one which has symbolic manipulation capabilities.

On-the-multiple choice problems:

- 1. You must give your final answers in the multiple choice answer box on the front page of your exam.
- 2. Carefully check your answers. No credit will be given for answers other than those indicated on the *multiple choice answer* box.

On the free response problems:

- 1. Clearly indicate your answer and the reasoning used to arrive at that answer (unsupported answers may not receive credit),
- 2. Give exact answers, rather than decimal approximations to the answer (unless otherwise stated).

Each free response question is followed by space to write your answer. Please write your solutions neatly in the space below the question. You are not expected to write your solution next to the statement of the question.

Multiple Choice Answers

Question			·		
1	A	В	С	D	E
2	A	В	С	D	Ε
3	Α	В	С	D	Ε
4	A	В	С	D	Е
5	A	В	С	D	Ε
6	A	В	С	D	Е
7	A	В	С	D	Е
8	A	В	С	D	Е
9	A	В	С	D	Е
10	A	В	С	D	Е

Exam Scores

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Question	Score	Total
MC		40
11		7
12		7
13		7
14		7
15		7
Webassign Score		75
Percentage		100

(1) Simplify and express answer exactly.



A) $\sqrt{30}$



- B) $\sqrt{41}$
- C) 8.236
- D) $6\sqrt{5}$
- E)) None of the answers above are the simplified expression.
- (2) Express the given geometric statement x is less than a distance of 5 units from 6 on the number line using absolute values.
 - A) |x 6| < 5B) |x 6| > 5
 - C) $|x_{-5}| < 6$
 - E) |5-6| > x
- (3) Find the distance on the number line between $\frac{3}{5}$ and $-\sqrt{2}$ exactly.
 - A) $\left| \frac{3}{5} \sqrt{2} \right|$
- 3-12 = 3+12
- B) $\frac{3}{5} + \sqrt{2}$

= 3+12

2

- C) $\left| \sqrt{2} \frac{3}{5} \right|$ D) $\frac{3-\sqrt{2}}{5}$
- Since 3+ 1220
- E) None of the above expressions are the correct distance.

(2+i)(2-i)

- (4) Simplify the expression and express in standard complex form.
 - A) 3 + 0i
 - B) 5i
 - C) 4 + i
 - D)5+0i
 - E) 2 i
- (5) State the domain of the function

$$f(x) = \sqrt{x - 4}.$$

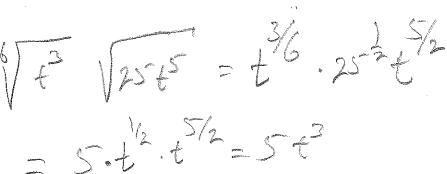
- A) $(4,\infty)$
- X-420 2 X24

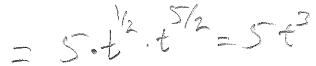
(2+i)(2-i) = 2-i= 4-i=5.

- B) $x \neq 4$ C) $(-\infty, \infty)$. The do man 15 [4, ∞).
- E) $(-\infty, 4)$
- (6) Simplify the expression and write the answer using exponents. (You may assume that $t \geq 0$

$$\sqrt[6]{t^3}\sqrt{25t^5}$$

- A) $25t^3$
- B) The expression can not be simplified.
- C) $5t^{9/2}$
- D) $5t^3$
- E) $5t^{8/15}$





 $V(1-3)^2+(-4-9)^2=1/(-2)^2+5^2$

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- (7) Find the distance in the Cartesian plane between the two points (1, -4) and (3, -9).
 - A) $\sqrt{41}$
 - B) $\sqrt{185}$
 - C) $\sqrt{45}$
- (8) Which one of the following expression is equivalent to the expression

$$(\sqrt{x}-a)^2$$

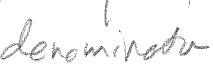
(You may assume $x \ge 0$)

(You may assume
$$x \ge 0$$
)
$$(\sqrt{x} - 2a\sqrt{x} + a^2) \left(\sqrt{x} - 4\right)^2 = (\sqrt{x})^2 - 2a\sqrt{x} + a^2$$

- B) x + a
- C) $x a^2$ $= \chi 2 \sqrt{\chi} + a^2$
- D) xa^2
- E) x-a
- (9) Find f(-1) for

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

- B) f(x) is undefined for x = -1.
 - D) 0
 - E) 2



Since the denomination x+1=0 of x=-1

(10) Which one of the following statements is true for all real numbers a and b?

A)
$$\frac{a}{a} = 1$$

B)
$$|a^2| = -\sqrt{a} \text{ for } a < 0.$$

C) $\sqrt{a^2} = |a|$

$$D) \mid -a \mid = a$$

E)
$$\sqrt{a^2 + b^2} = a + b$$

Afails of a = 0

Blails for many reasons.
For example la 15 analogical aco.

D) /acls of a < 0

E) /ais / a=5=1.

12-12-01. 1+1=2

but 12 7 2.

Free Response Questions: Show your work!

(11) Find the center and radius of the circle by completing the square. (Hint: The equation is in fact a circle!)

 $x^2 + 8x + y^2 - 2y + 5 = 0$

Show all necessary steps!

Complete the 37424 = -5+16+1 $27+9\times +16+1$

 $(\chi + 4)^2 + (q - 1)^2 = 12.$

(x-4)2 +(y-1) = (V12)2.

Thenset of points (x, y) schs/ging

Ryis equotion (s de set of

Points (x,y) at distance V12

from (-4,1).

(12) Find the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the function $f(x)=x^2+3x+1$ and simplify the result.

 $(\chi + h)^2 + 3(\chi + h) + 1 - (\chi^2 + 3\chi + 1)$ Asquare

Expelsquere has the first the first

Curcel

2xh+1 +3h

= 2x+3+h.

(13) Find the equation of the line through (4, -3) and parallel to the line 2x + 3y - 6 = 0.

$$\frac{34}{4} = -\frac{2}{3}x + \frac{1}{2}$$

$$\frac{3}{4} = -\frac{2}{3}x + \frac{1}{2}$$

The heer ext37-6=0 hors sope -2/3.

The heer ext37-6=0 hors sope -2/3.

The heer thru (4,-3)

with slope

$$y-3=-\frac{2}{3}(x-4)$$

Free Response Questions: Show your work!

(14) Solve the quadratic equation and express the answer in standard complex form.

$$x^2 + 2x + 5 = 0$$

$$\chi^{2} + 2x + 1 = -5 + 1$$
 $(x + 1)^{2} = -4$
 $\chi + 1 = \pm \sqrt{-4}$
 $= \pm 2i$

(15) Sketch the graph of f(x) = |x+1| and state the domain and range.

