MA109 — College Algebra Fall 2018
Exam 3 2018-11-14

Name: _____ **Sec.:** _____

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The exam consists of multiple choice questions. Record your answers on this page. For each multiple choice question, you will need to fill in the circle corresponding to the correct answer. For example, if (a) is correct, you must write

(a) **b** **c** **d** **e**

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GOOD LUCK!

1.	**a**	**b**	**c**	**d**	**e**	**11.**	**a**	**b**	**c**	**d**	**e**
2.	**a**	**b**	**c**	**d**	**e**	**12.**	**a**	**b**	**c**	**d**	**e**
3.	**a**	**b**	**c**	**d**	**e**	**13.**	**a**	**b**	**c**	**d**	**e**
4.	**a**	**b**	**c**	**d**	**e**	**14.**	**a**	**b**	**c**	**d**	**e**
5.	**a**	**b**	**c**	**d**	**e**	**15.**	**a**	**b**	**c**	**d**	**e**
6.	**a**	**b**	**c**	**d**	**e**	**16.**	**a**	**b**	**c**	**d**	**e**
7.	**a**	**b**	**c**	**d**	**e**	**17.**	**a**	**b**	**c**	**d**	**e**
8.	**a**	**b**	**c**	**d**	**e**	**18.**	**a**	**b**	**c**	**d**	**e**
9.	**a**	**b**	**c**	**d**	**e**	**19.**	**a**	**b**	**c**	**d**	**e**
10.	**a**	**b**	**c**	**d**	**e**	**20.**	**a**	**b**	**c**	**d**	**e**

For grading use:

Number Correct	
	(out of 20 problems)

Total	
	(out of 100 points)

Name: _____

Multiple Choice Questions

Show all your work on the page where the question appears.
Clearly mark your answer both on the cover page on this exam
and in the corresponding questions that follow.

1. What is the leading term of $777 + 2x^{44} + 6x^5 + 99x^8 + 3x$?

   Possibilities:

   (a) $3x$

   (b) $6x^5$

   (c) $2x^{44}$

   (d) $99x^8$

   (e) 777

2. Which of the following best describes the end behavior of $f(x) = -2x^{99} + 7x^8$?

   Possibilities:

   (a) $y \to \infty$ as $x \to -\infty$ and $y \to \infty$ as $x \to \infty$

   (b) $y \to -\infty$ as $x \to -\infty$ and $y \to \infty$ as $x \to \infty$

   (c) $y \to -\infty$ as $x \to -\infty$ and $y \to -\infty$ as $x \to \infty$

   (d) $y \to 0$ as $x \to -\infty$ and $y \to 0$ as $x \to \infty$

   (e) $y \to \infty$ as $x \to -\infty$ and $y \to -\infty$ as $x \to \infty$

3. Suppose a polynomial has $x = \frac{2}{13}$ as a root. Which of these must be a factor of the polynomial?

   Possibilities:

   (a) $(x + 11)$

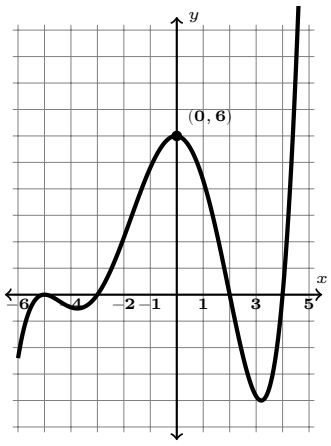
   (b) $\left(\frac{2}{13}x\right)$

   (c) $(2x - 13)$

   (d) $(13x - 2)$

   (e) $(x - 11)$

4. Let $f(x)$ be the polynomial whose graph is given below. All of the roots of the polynomial are shown. What can be said about the leading coefficient and degree of the polynomial?



Possibilities:

(a) The leading coefficient is zero, the degree is negative.

(b) The leading coefficient is negative, the degree is odd.

(c) The leading coefficient is positive, the degree is odd.

(d) The leading coefficient is positive, the degree is even.

(e) The leading coefficient is negative, the degree is even.

---

5. Refer to the graph from problem 4. Which of these cannot be factors of the polynomial in the graph?

Possibilities:

(a) $(x - 6)$

(b) $(x + 5)$

(c) $(x - 2)$

(d) $(x - 4)$

(e) $(x + 3)$

---

6. Refer to the graph from problem 4. Which root of the polynomial has even multiplicity?

Possibilities:

(a) $x = -5$

(b) $x = 6$

(c) $x = 2$

(d) $x = 4$

(e) $x = -3$

---

7. Let

$$r(x) = \frac{8x - 24}{x^2 - 4x + 4}$$

The graph of $y = r(x)$ has an x-intercept at:

Possibilities:

(a) $x = 8$

(b) $x = 3$

(c) $x = 2$

(d) $x = -6$

(e) $x = 0$

---

8. Let

$$s(x) = \frac{15x - 180}{4x - 36}$$

The graph of $y = s(x)$ has a vertical asymptote at:

Possibilities:

(a) $x = 9$

(b) $x = 0$

(c) $x = \frac{15}{4}$

(d) $x = 5$

(e) $x = 12$

---

9. Let

$$s(x) = \frac{15x - 180}{4x - 36}$$

The graph of $y = s(x)$ has a horizontal asymptote at:

Possibilities:

(a) $y = \frac{15}{4}$

(b) $y = 0$

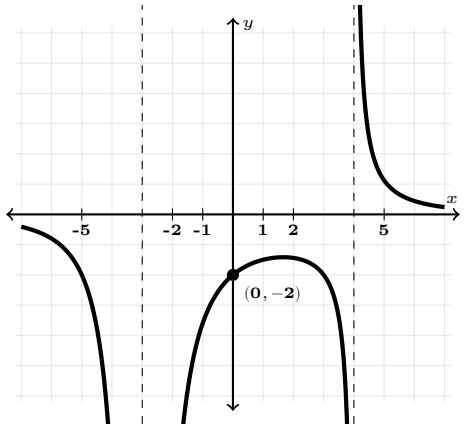
(c) $y = 9$

(d) $y = 5$

(e) $y = 12$

---

10. Which of the following is most reasonable as the equation of the following graph:



Possibilities:

(a) $f(x) = \dfrac{-72}{(x-3)^2(x+4)}$

(b) $f(x) = \dfrac{96}{(x-3)(x+4)^2}$

(c) $f(x) = \dfrac{1}{(x+3)(x-4)^2}$

(d) $f(x) = \dfrac{72}{(x+3)^2(x-4)}$

(e) $f(x) = \dfrac{-2}{(x+3)^2(x+4)}$

---

11. Find all real distinct solutions x to $\sqrt{x-6}+5=9$

Possibilities:

(a) $x = 62$ only

(b) $x = 81$ and $x = -81$

(c) $x = 22$ only

(d) $x = 8$ only

(e) $x = 81$ only

---

12. Find all real distinct solutions x to $\sqrt{x^3} = 64$.

Possibilities:

(a) $x = 8$ only

(b) $x = 2$ and $x = -2$

(c) $x = 512$ and $x = -512$

(d) $x = 16$ only

(e) $x = 4$ only

---

13. Let $f(x) = \sqrt[9]{2x+7} + 8$. What is the formula for $f^{-1}(x)$?

Possibilities:

(a) $f^{-1}(x) = \dfrac{x - 174571335}{2}$

(b) $f^{-1}(x) = \dfrac{(x-8)^9 - 7}{2}$

(c) $f^{-1}(x) = \dfrac{(x-7)^9 - 8}{2}$

(d) $f^{-1}(x) = \dfrac{8 \pm \sqrt[9]{x-7}}{2}$

(e) $f^{-1}(x) = \sqrt[9]{2x+15}$

---

14. Find an exponential function that satisfies $f(0) = 11$ and $f(1) = 33$.

Possibilities:

(a) $f(x) = 33 \cdot 11^x$

(b) $f(x) = 22^x$

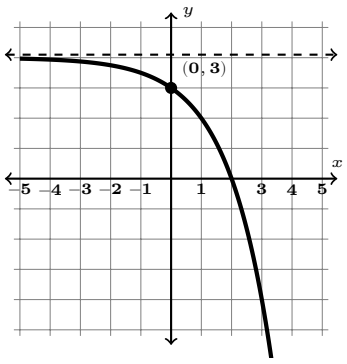
(c) $f(x) = 11 \cdot 33^x$

(d) $f(x) = 3 \cdot 11^x$

(e) $f(x) = 11 \cdot 3^x$

---

15. Let $f(x)$ be a function whose graph is given below. Which is the most reasonable formula for $f(x)$?



Possibilities:

(a) $f(x) = 2^{4-x}$

(b) $f(x) = 4 \cdot 2^x$

(c) $f(x) = 4 - 2^x$

(d) $f(x) = 2^x + 4$

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

---

16. What is the end behavior of $f(x) = 11^x$ on the right as $x \to \infty$?

Possibilities:

(a) $y \to -\infty$ as $x \to \infty$

(b) $y \to 0$ as $x \to \infty$

(c) $y \to 11$ as $x \to \infty$

(d) $y \to \infty$ as $x \to \infty$

(e) $y \to 1$ as $x \to \infty$

---

17. What is the range of $g(x) = 999^x - 89$?

Possibilities:

(a) $(-88, \infty)$

(b) $(-89, \infty)$

(c) $(999, \infty)$

(d) $(0, \infty)$

(e) $(-\infty, \infty)$

---

18. Find the y-intercept of

$$h(x) = -3 \cdot 2^{x+1} + 96$$

Possibilities:

(a) $y = 96$

(b) $y = 4$

(c) $y = 0$

(d) $y = -3$

(e) $y = 90$

---

19. What is the domain of $\log_{272}(89 - x)$?

Possibilities:

(a) [272,∞)

(b) (-∞,89)

(c) [89,∞)

(d) (-∞,272)

(e) (-∞,∞)

20. If $B^2 = 11$, then

Possibilities:

(a) $\log_{11}(B) = 2$

(b) $\log_{2}(B) = 11$

(c) $\log_{B}(2) = 11$

(d) $\log_{2}(11) = B$

(e) $\log_{B}(11) = 2$

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