

Practice Exam for Exam 2, Math 1111, Spring 2007

Print Your Name:

- (1) No calculator with a CAS on it such as the TI-85 or TI-92.
- (2) In some problems you will need to circle more than one alternatives.
- (3) Some problems are not multiple choice.

1. Let $f(x) = 2x - 1$ and $g(x) = x^2 + 1$. Find $(f \circ g)(1)$

- A) 1 B) 2 C) 3 D) 4 E) None of these

2. Let $f(x) = 2x - 1$ and $g(x) = x^2 + 1$. Find $(f \circ f)(1)$

- A) 1 B) 2 C) 3 D) 4 E) None of these

3. Let $f(x) = 2x - 1$. Find $f^{-1}(3)$.

- A) 1 B) 2 C) 3 D) 4 E) None of these

4. Find the inverse function of $f(x) = 3x - 1$.

- A) $f^{-1}(x) = \frac{x}{3} + 1$ B) $f^{-1}(x) = \frac{1}{3x-1}$ C) $f^{-1}(x) = 3x + 1$ D) $f^{-1}(x) = \frac{x}{3} + \frac{1}{3}$ E) None of these.

5. Find the midpoint of $(1, 6)$ and $(3, -2)$.

- A) $(2, 2)$ B) $(2, 4)$ C) $\sqrt{8}$ D) $\sqrt{68}$ E) None of these

6. Find the distance between $(1, 6)$ and $(3, -2)$.

- A) $(2, 2)$ B) $(2, 4)$ C) $\sqrt{8}$ D) $\sqrt{68}$ E) None of these

7. Find the center of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$

- A) $(1, 2)$ B) $(1, -2)$ C) $(-1, 2)$ D) $(-1, -2)$ E) None of these.

8. Find the radius of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$

- A) 1 B) 2 C) 3 D) 4 E) None of these.

9. Find an equation of the circle centered at (1, 2) with radius 4.

- A) $x^2 + y^2 - 2x - 4y - 11 = 0$ B) $x^2 + y^2 + 2x + 4y - 11 = 0$
C) $x^2 + y^2 - x - 2y - 11 = 0$ D) $x^2 + y^2 + x + 2y - 11 = 0$ E) None of these

10. Find the axis of symmetry of the quadratic function $y = 2x^2 - 6x + 3$.

- A) $x = 2$ B) $y = 2$ C) $x = 3$ D) $x = -3$ E) $y = -3$

11. Find the minimum of the quadratic function $y = 2x^2 - 6x + 3$.

- A) -1.5 B) -0.5 C) 0.5 D) 1.5 E) None of these.

12. Find the vertex of the quadratic function $y = 2x^2 - 6x + 3$.

- A) $(3, -\frac{3}{2})$ B) $(-3, -\frac{3}{2})$ C) $(3, \frac{3}{2})$ D) $(-3, \frac{3}{2})$ E) None of these.

13. Find the range of the quadratic function $y = 2x^2 - 6x + 3$.

- A) $(-\infty, -\frac{3}{2}]$ B) $(-\infty, \frac{3}{2}]$ C) $[-\frac{3}{2}, \infty)$ D) $[\frac{3}{2}, \infty)$ E) None of these

14. Find all the zeros of the polynomial function $f(x) = x^3 + 2x^2 - 4x - 8$.

- A) 2 B) 4 C) -2 D) -4 E) 0

15. What is the remainder when $x^3 + 2x + 1$ is divided by $x - 1$?

- A) $x^2 + x + 2$ B) $x^2 + x + 3$ C) $x^2 - x + 1$ D) 4 E) None of these.

16. What is the quotient when $x^3 + 2x + 1$ is divided by $x - 1$?

- A) $x^2 + x + 2$ B) $x^2 + x + 3$ C) $x^2 - x + 1$ D) 4 E) None of these.

17. Simplify $(2 + i)(3 - 2i)$.

A) $8 - i$ B) $8 + i$ C) $5 - i$ D) $5 + i$ E) None of these.

18. Add $(2 + i) + (3 - 2i)$.

A) $8 - i$ B) $8 + i$ C) $5 - i$ D) $5 + i$ E) None of these.

19. Simplify $\frac{1+i}{1-i}$.

A) 1 B) i C) 2 D) $2i$ E) None of these.

In problems 21, 21, and 22, show your work.

20. Show that $f(x) = x^3 - 2x - 1$ has at least one zero between 1 and 2.

21. Use the long division to find the quotient and remainder when $x^3 - 3x^2 + 3x + 4$ is divided by $-x + 1$.

Quotient =

Remainder =

22. Use the synthetic division to find the quotient and remainder when $x^3 - 3x^2 + 3x + 4$ is divided by $x - 1$.

Quotient =

Remainder =