

INSTRUCTIONS

The quiz is worth 35 points. There are 10 multiple choice (2 points) and 5 (3 points) short answer problems.

- ☐ This quiz is **open book** and **open notes**, and you may take as long as you like on it provided that you submit the quiz no later than the due date posted in our course schedule of the syllabus. You may refer to your textbook, notes, and online classroom materials, **but you may not consult anyone**.
- ☐ **You must show all of your work for the short answers to receive full credit.** If you do not show work, you may earn only partial or no credit at the discretion of the professor. Work for multiple choice is not mandatory, but highly recommended. No points are give for the work for these.
- ☐ Please type your answers in the separate answet sheet. Scanned handwritten work is also acceptable. Be sure to include your name in the document. Review instructions for submitting your quiz in the Unit Quizzes Module.

If you have any questions, please contact me by e-mail.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Add or subtract as indicated and write the result in standard form.

1) $3 - (-6 + 9i) - (1 - 6i)$

A) $8 - 3i$

B) $5 - 3i$

C) $8 + 3i$

D) $5 + 3i$

Divide and express the result in standard form.

2) $\frac{7}{5 + i}$

A) $\frac{35}{24} + \frac{7}{24}i$

B) $\frac{35}{26} + \frac{7}{26}i$

C) $\frac{35}{26} - \frac{7}{26}i$

D) $\frac{35}{24} - \frac{7}{24}i$

Find the axis of symmetry of the parabola defined by the given quadratic function.

3) $f(x) = (x + 3)^2 + 4$

A) $x = 3$

B) $y = -4$

C) $x = -3$

D) $y = 4$

Find the horizontal asymptote, if any, of the graph of the rational function.

4) $f(x) = \frac{4x}{2x^2 + 1}$

A) $y = \frac{1}{2}$

B) $y = 0$

C) $y = 2$

D) no horizontal asymptote

5) $g(x) = \frac{15x^2}{5x^2 + 1}$

A) $y = \frac{1}{3}$

B) $y = 0$

C) $y = 3$

D) no horizontal asymptote

Find the vertical asymptotes, if any, of the graph of the rational function.

6) $h(x) = \frac{x + 2}{x^2 - 4}$

A) $x = -2$

B) $x = 2$

C) $x = 2, x = -2$

D) no vertical asymptote

7) $f(x) = \frac{x}{x(x - 2)}$

A) $x = 2$

B) $x = 0$ and $x = -2$

C) $x = 0$ and $x = 2$

D) no vertical asymptote

Perform the indicated operations and write the result in standard form.

8) $(\sqrt{-64})(\sqrt{-49})$

A) $-56i$

B) 56

C) -56

D) $56i^2$

9) $\sqrt{-16} + \sqrt{-64}$

A) $12i$

B) -12

C) $-12i$

D) $32i$

Solve the quadratic equation using the quadratic formula. Express the solution in standard form.

10) $8x^2 - 3x + 6 = 0$

A) $\left\{ \frac{3}{16} \pm \frac{\sqrt{183}}{16} \right\}$

B) $\left\{ -\frac{3}{16} \pm \frac{\sqrt{183}}{16} \right\}$

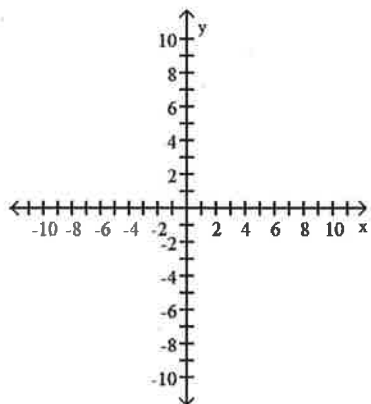
C) $\left\{ -\frac{3}{16} \pm i \frac{\sqrt{183}}{16} \right\}$

D) $\left\{ \frac{3}{16} \pm i \frac{\sqrt{183}}{16} \right\}$

SHORT ANSWER. You must show all your work to receive full credit.

For the polynomial, state (a.) the degree (b.) whether it is odd or even or neither (c.) end behavior (d.) number of zeros and multiplicities if any. (e.) Graph the polynomial function.

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



Solve the polynomial inequality. Express the solution set in interval notation.

12) $x^2 - 2x - 35 \leq 0$

Solve the problem.

- 13) An arrow is fired straight up from the ground with an initial velocity of 208 feet per second. Its height, $s(t)$, in feet at any time t is given by the function $s(t) = -16t^2 + 208t$. Find the interval of time for which the height of the arrow is greater than 480 feet.

Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

14) $\frac{x-1}{x+8} > 0$

Use the Intermediate Value Theorem to determine whether the polynomial function has a real zero between the given integers.

15) $f(x) = 7x^5 - 3x^3 + 10x^2 - 1$; between -2 and -1