

MRS21 – Algebra 2/Trigonometry
Exam 3 Review Sheet

Topics:

- Simplifying Radicals
- Adding and Subtracting Radicals
- Multiplying and Dividing Radicals
- Rationalizing Fractions with Radical Denominators (monomial and binomial)
- Properties of Complex Numbers
- Simplifying Powers of i and Performing Operations with Complex Numbers
- Simplifying Fractions with Complex Denominators

Be sure to thoroughly prepare for the exam by reviewing (and re-doing) problems in your class notes and homework assignments.

Note that exams are **cumulative**, meaning that some questions on this exam will cover topics that were tested on previous exams and quizzes.

Practice Problems:

1. Express in simplest radical form: $-4\sqrt[3]{54a^6b^4}$
2. Combine and express the result in simplest form: $\frac{40}{\sqrt{8}} - \sqrt{50}$
3. Rationalize the denominator and simplify the result:
 - (a) $\frac{6}{5-2\sqrt{7}}$
 - (b) $\frac{\sqrt{5} + 3\sqrt{2}}{\sqrt{5} - 3\sqrt{2}}$
4. Express in simplest radical form: $(1 - 8\sqrt{2})^2$
5. Express in simplest radical form: $3\sqrt{\frac{4}{3}} + 6\sqrt{48}$
6. If $(\sqrt{128} - \sqrt{72})$ is divided by $\sqrt{8}$, the result is
 - (1) 1
 - (2) $8\sqrt{2} - 3$
 - (3) $\sqrt{7}$
 - (4) $4 - 6\sqrt{2}$
7. Combine and express the result in simplest form: $x\sqrt{48} - 2\sqrt{75x^2}$
8. Find the solution set of each equation: (a) $\sqrt{x+4} = -3$ (b) $3 + \sqrt{4x-3} = 2x$.
9. The fraction $\frac{3}{\sqrt{3a^2b}}$ is equivalent to
 - (1) $\frac{1}{a\sqrt{b}}$
 - (2) $\frac{\sqrt{b}}{ab}$
 - (3) $\frac{\sqrt{3b}}{ab}$
 - (4) $\frac{\sqrt{3}}{a}$
10. Express the multiplicative inverse of $5 - 7i$ in $a + bi$ form.
11. In what quadrant does the sum of $6 - 5i$ and $4 + 6i$ lie?
12. Simplify i^{303} .
13. In the set of complex numbers, $(3 + 2i)(2 - 5i) = 4c + di$. Find the values of *both* c and d .
14. Express in simplest $a + bi$ form: $(i^3 - 1)(i^3 + 1)$.
15. What is the *greatest* possible integral value of x for which $\sqrt{x-5}$ is an imaginary number?
16. What is the product of $5 + \sqrt{-36}$ and $1 - \sqrt{-49}$ expressed in simplest $a + bi$ form?
 - (1) $-37 + 41i$
 - (2) $37 + 41i$
 - (3) $5 - 71i$
 - (4) $47 - 29i$
17. Simplify and express in terms of i : $\frac{\sqrt{-36}}{-\sqrt{36}}$.