Test #3

Evaluate and simplify:

1. \(16^2\)

2. \(\left(\frac{27}{8}\right)^{\frac{2}{3}}\)

3. Write \(\frac{4}{5}b^\frac{1}{5}\) as a single radical.

4. Write \(\sqrt[4]{a^3b}\) using positive rational exponents.

5. Simplify and write using only positive rational exponents:
   \[
   \frac{28u^{\frac{2}{5}}}{7u^{\frac{1}{4}}}
   \]

6. Write 56,700,000,000,000 in scientific notation.

7. Write 6.89 \times 10^{-4} as an ordinary decimal number.

8. Add: \((8 + 7i) + (-6 - 3i)\)

9. Subtract: \((9 - 6i) - (4 - i)\)

10. Multiply (and completely simplify): \((7 + 5i)(4 - 3i)\)

11. Write \(\sqrt{-25}\) in terms of \(i\).

Point values:
1-4, 6-7: 5 each
5, 8-10: 6 each
11: 4 points
12-17: 7 each
Solve the equations. Some answers may be complex. Write your answers in lowest terms.

12. \((y + 7)^2 = 13\) \hspace{1cm} 13. \(5x^2 - 2x + 3 = 0\) \hspace{1cm} 14. \(v^2 + 12v + 4 = 0\)

15. \(2w^2 + 3w + 4 = 0\) \hspace{1cm} 16. \((x - 5)^2 = 49\)

Solve. Graph your solution and give your answer in interval notation.

17. \((y - 5)(y + 8) < 0\)
Answers

1. 64
2. \( \frac{4}{9} \)
3. \( \sqrt[5]{a^4b} \)
4. \( \frac{3}{a^4b^\frac{1}{4}} \)
5. \( \frac{3}{4u^{\frac{3}{20}}} \)
6. \( 5.67 \times 10^{13} \)
7. 0.000689
8. \( 2 + 4i \)
9. \( 5 - 5i \)
10. \( 43 - i \)
11. \( 5i \)
12. \( -7 \pm \sqrt{13} \)
13. \( \frac{1 \pm i\sqrt{14}}{5} \)
14. \( -6 \pm 4\sqrt{2} \)
15. \( \frac{-3 \pm i\sqrt{23}}{4} \)
16. \( \{-2, 12\} \)
17. \( (-8, 5) \)