

Algebra 2 Chapter 1 Practice Test

#1 Solve these inequalities. Express your answer as an inequality, on a number line or in interval notation. (4 pts each)

a) $x^2 + 3x > 4$

b) $2(7x - 3) \leq 12x + 16$

c) $(x - 4)(3x + 2)(x + 6) \geq 0$

d) $\frac{-2x + 4}{(x - 4)(x + 9)} \leq 0$

#2 Solve these equations. Give all solutions, real or complex. (4 pts each)

a) $x^4 = 25x^2$

b) $\frac{10}{x - 12} + \frac{9}{x + 12} = \frac{126}{x^2 - 144}$

c) $2x^2 - 2x = -5$

d) $3x^3 + 5x^2 - 12x - 20 = 0$

#3 Simplify these expressions. No i in the denominator, no negatives under the radical and no power on i greater than one. (3 pts each)

a) $(6 - 2i)^2$

b) $i^{14} + i^{45}$

c) $(2\sqrt{-6})(3 - \sqrt{-12})$

d) $\frac{8}{7 - 2i}$

#4 Solve these equations and inequalities involving absolute value. Express your answer in any appropriate manner. (3 pts each)

a) $|x - 4| < 7$

b) $3|2x + 1| - 8 = 13$

#5 Without solving, determine if $2x^2 - 2x = 3$ has real or complex roots. Justify your answer. (2 pts)

#6 So far on this test, you have been finding the solution to a given problem. Here, you are being given the solution and asked for the problem. You may leave your answer in any form you wish. (2 pts each)

a) Give a quadratic equation that has solutions of -4 and 8

b) Give an absolute value inequality that has a solution of $-6 < x < 6$

c) Give a polynomial inequality that has a solution of $[-1, 2] \cup [3, \infty)$

#7 Solve this word problem. Be sure to show the appropriate work to receive full credit. Points are given for the process so do what you can, even if you cannot determine the final answer. (6 pts)

Mr. Marsheck drove for part of a 150 mi trip at 45 mph and then (realizing that he was late) drove the rest at 75mph. How far did Mr. Marsheck drive at 45 mph if the total trip took 2 hrs and 40 mins?

#8 (Multiple Choice) Which one of the following is not a quadratic in disguise? (2 pts)

a) $x^6 - 2x^3 = 3$

b) $(x+5)^2 - 3(x+5) - 10 = 0$

c) $x - 5\sqrt{x} + 6 = 0$

d) $x^5 - 27x^2 = 0$

Practice Test Ch 1 Answers:

1. a) $x < -4 \cup x > 1$ b) $x \leq 11$ c) $-6 \leq x \leq -\frac{2}{3} \cup x \geq 4$

d) $(-9, 2] \cup (4, \infty)$

2. a) 0, 5, -5 b) 6 c) $\frac{1 \pm 3i}{2}$ d) 2, -2, $-\frac{5}{3}$

3. a) $32 - 24i$ b) $i - 1$ c) $12\sqrt{2} + 6i\sqrt{6}$ d) $\frac{56 + 16i}{53}$

4. a) $(-3, 11)$ b) 3, -4

5. real because discriminant is greater than 0

6. a) $(x + 4)(x - 8) = 0$ b) $|x| < 6$ c) $(x + 1)(x - 2)(x - 3) > 0$

7. 1 hr and 40 mins at 45 mph

8. d