

Precalculus – Chapter 2  
Partner Test

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Hour: \_\_\_\_\_

For #1-4, solve the equations using square roots, factoring, the quadratic formula, or completing the square. Simplify all solutions. **Show all work!**

1.  $5x^2 - 4x = 1$                       2.  $3(x-1)^2 - 36 = 0$                       3.  $\frac{x^2 + 3x - 10}{x^2 - 25} = 0$                       1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. Solve by using the **quadratic formula**. Show all work! Simplify exact answers.  
 $3x^2 - 1 = 7x$                       4. \_\_\_\_\_

5. Solve by **completing the square**. Show all work! Simplify exact answers.  
 $3x^2 + 12x - 75 = 0$ .                      5. \_\_\_\_\_

6. Find the exact real solutions of:  $x^4 - 13x^2 + 36 = 0$ .                      6. \_\_\_\_\_

7. A. Determine the discriminant for  $3x^2 - 2x = 3$ .  
B. Determine the number of real solutions.                      7.A. \_\_\_\_\_ B. \_\_\_\_\_

For #8-11, solve algebraically. Check for extraneous solutions! **Show all work!**  
8.  $\sqrt[4]{2x-3} + 3 = 6$                       8. \_\_\_\_\_

9.  $\sqrt{x-3} + \sqrt{x+5} = 4$

9. \_\_\_\_\_

10.  $|x^2 - 6x + 1| = 8$

10. \_\_\_\_\_

11.  $|3x - 2| = 5x + 4$

11. \_\_\_\_\_

12.  $-5(x-2) < -20$  or  $2x+3 > 5x-6$

12. \_\_\_\_\_  
interval notation

13.  $3x - 2 \leq x + 10 < 4x + 1$

13. \_\_\_\_\_  
interval notation

14.  $x^2 - 3x - 10 \leq 0$

14. \_\_\_\_\_  
interval notation

15. Solve the equation for  $c$ :  $A = 3\pi\sqrt{\frac{b}{c}}$

15. \_\_\_\_\_

16. Solve  $3|2x - 4| \geq 12$

16. \_\_\_\_\_

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Name: \_\_\_\_\_  
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For #1-4, solve the equations using square roots, factoring, the quadratic formula, or completing the square. Simplify all solutions. Show all work!

1.  $5x^2 - 4x = 1$

2.  $3(x-1)^2 - 36 = 0$

3.  $\frac{x^2 + 3x - 10}{x^2 - 25} = 0$

1.  $-\frac{1}{5}, 1$  +3

$5x^2 - 4x - 1 = 0$

$3(x-1)^2 = 36$   
 $\sqrt{(x-1)^2} = \sqrt{12}$

$(x+5)(x-2) = 0$   
 $(x-5)(x+5)$   
 ~~$x = 5$~~

2.  $1 \pm 2\sqrt{3}$  +3

$(5x+1)(x-1) = 0$

$x-1 = \pm 2\sqrt{3}$   
 $x = 1 \pm 2\sqrt{3}$

3.  $x = 2$  +3

$x = -\frac{1}{5} \quad x = 1$

4.  $\frac{7 \pm \sqrt{61}}{6}$  +4

4. Solve by using the quadratic formula. Show all work! Simplify exact answers.

$3x^2 - 1 = 7x$

$3x^2 - 7x - 1 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{7 \pm \sqrt{49 - 4(3)(-1)}}{2 \cdot 3}$

$\frac{7 \pm \sqrt{49 + 12}}{6} = \frac{7 \pm \sqrt{61}}{6}$

5. Solve by completing the square. Show all work! Simplify exact answers.

5.  $-2 \pm \sqrt{29}$  +4

$\frac{3x^2 + 12x - 75}{3 \quad 3 \quad 3 \quad 3} = 0$

$(x+2)^2 = -29$   
 $x = -2 \pm \sqrt{29}$

$x^2 + 4x - 25 = 0$

$x^2 + 4x + 4 = 25 + 4$

6. Find the exact real solutions of:  $x^4 - 13x^2 + 36 = 0$ .

6.  $\pm 3, \pm 2$  +4

$x^2 - 9 = 0$   
 $\sqrt{x^2} = \sqrt{9}$   
 $x = \pm 3$

$(x^2 - 9)(x^2 - 4) = 0$   
 $x = \pm 3 \quad x = \pm 2$

7. A. Determine the discriminant for  $3x^2 - 2x = 3$ .

7.A. 40 B. 2 +3

B. Determine the number of real solutions.

$3x^2 - 2x - 3 = 0$   
 $b^2 - 4ac$   
 $4 - 4(3)(-3) \quad 4 + 36$

For #8-11, solve algebraically. Check for extraneous solutions! Show all work!

8.  $\sqrt[4]{2x-3} + 3 = 6$

8.  $x = 42$  +4

$(\sqrt[4]{2x-3} + 3)^4 = 6^4$

$2x - 3 = 81$   
 $2x = 84$

$x = 42$

20



9.  $\sqrt{x-3} + \sqrt{x+5} = 4$

$(\sqrt{x-3})^2 = (4 - \sqrt{x+5})^2$

$x-3 = 16 - 8\sqrt{x+5} + x+5$   
 $-3 = 21 - 8\sqrt{x+5}$

$-24 = -8\sqrt{x+5}$

$(3)^2 = (\sqrt{x+5})^2$

$9 = x+5$

$4 = x$

④ 9.  $x=4$

10.  $|x^2 - 6x + 1| = 8$

$x^2 - 6x + 1 = 8$

$x^2 - 6x - 7 = 0$

$(x-7)(x+1) = 0$

$x^2 - 6x + 1 = -8$

$x^2 - 6x + 9 = 0$

$(x-3)^2 = 0$

④ 10.  $-1, 3, 7$

11.  $|3x-2| = 5x+4$

$3x-2 = 5x+4$

$-6 = 2x$

~~$-3 = x$~~

$3x-2 = -5x-4$

$8x = -2$

$x = -2/8 = -1/4$

④ 11.  $x = -1/4$

12.  $-5(x-2) < -20$  or  $2x+3 > 5x-6$

$-5x+10 < -20$

$-5x < -30$

$x > 6$

$9 > 3x$

$3 > x$

or

$x < 3$

④ 12.  $(-\infty, 3) \cup (6, \infty)$   
interval notation

13.  $3x-2 \leq x+10 < 4x+1$

$3x-2 \leq x+10$

$2x \leq 12$

$x \leq 6$

and  $x+10 < 4x+1$

$9 < 3x$

$3 < x$

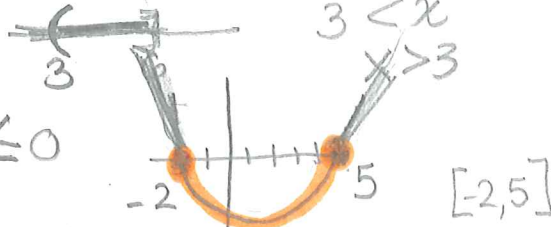
$x > 3$

④ 13.  $(3, 6]$   
interval notation

14.  $x^2 - 3x - 10 \leq 0$

$(x-5)(x+2) \leq 0$

$x=5 \quad x=-2$



④ 14.  $[-2, 5]$   
interval notation

15. Solve the equation for c:  $A = 3\pi\sqrt{\frac{b}{c}}$

$(\frac{A}{3\pi})^2 = (\frac{\sqrt{b}}{\sqrt{c}})^2$

$\frac{A^2}{9\pi^2} = \frac{b}{c}$

$A^2c = 9\pi^2b$

$c =$

④ 15.  $\frac{9\pi^2b}{A^2}$

16. Solve  $3|2x-4| \geq 12$

$|2x-4| \geq 4$

$2x-4 \leq -4$

$2x \leq 0$

$x \leq 0$

or  $2x-4 \geq 4$

$2x \geq 8$

$x \geq 4$



④ 16.  $(-\infty, 0] \cup [4, \infty)$   
 $x \leq 0$  or  $x \geq 4$

