

Name:

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Do not begin your test until instructed to do so. You will have 45 minutes to complete the test. The **only** items you are permitted to use are a pencil, eraser, and calculator. Any use of any other item will result in getting a 0 on the test. Keep your eyes on your own test. Getting answers in any form from others will result in getting a 0 on the test. Most of the credit is for showing your work (when appropriate), and the rest for the right answer.  your answers (when appropriate). Talking while any test is out will result in a 10 point penalty.

Good luck! (Even though this is a matter of skill, not luck.)

Page	Points	Score
2	40	
3	36	
4	24	
Total:	100	

1. (4 points) In which quadrants are the points  $(-1, 4)$  and  $(4, -1)$ , respectively?
  
2. (6 points) Solve  $\frac{x}{5} = \frac{x-3}{3} + 1$ .
  
3. (4 points) Determine whether  $4x + 5x = 8x$  is an identity, a conditional equation, or an inconsistent equation.
  
4. (6 points) One number exceeds another by 26. The sum of the numbers is 64. What are the numbers?
  
5. (5 points) Solve  $A = \frac{1}{2}h(a + b)$  for  $b$ .
  
6. (4 points) Write  $(-3 + 4i)(1 + 2i)$  in standard form.
  
7. (5 points) Write  $(1 - 4i)^2$  in standard form.
  
8. (6 points) Write  $\frac{-2i}{3 - 2i}$  in standard form.

9. (6 points) What constant should be added to  $x^2 - \frac{2}{3}x$  to make it a perfect square? Then write and factor the trinomial.
10. (5 points) Solve  $9x^2 - 9x = 2$ .
11. Consider  $x^2 + 3x - 1 = 0$ .
- (a) (4 points) Find the discriminant, then determine the number and type of solutions for the equation.
- (b) (4 points) Solve the equation.
12. (5 points) An unusually wide doorway is 6 feet wide and 8 feet tall. What is the length of the longest rectangular panel that can be taken through this doorway diagonally?
13. (6 points) Solve  $2x - 3 = 8x^3 - 12x^2$ .
14. (6 points) Solve  $x - \sqrt{2x + 5} = 5$ .

15. (7 points) Solve  $x^{-2} - x^{-1} - 20 = 0$ .

16. (5 points) Solve  $|3x - 1| = 5$ .

17. (6 points) Solve  $|2x - 6| + 1 < 9$ .

18. (6 points) Solve  $|x - 1| + 2 \geq 8$ .

19. (6 points (bonus)) You invested \$8000 in two accounts paying 4% and 6% annual interest, respectively. If the total interest earned for the year was \$460, how much was invested at each rate?

20. (6 points (bonus)) Solve  $\frac{3}{2x - 2} + \frac{1}{2} = \frac{2}{x - 1}$ .