

**Math 100**  
**Final Exam**

Name \_\_\_\_\_  
Section \_\_\_\_\_ Date \_\_\_\_\_ Score \_\_\_\_\_

**Show all work for full credit!**

1. Evaluate, when  $a = 3$ ,  $b = 4$ , and  $c = -2$ .

$$\frac{c - (a - b^2) + 2a}{b + ac}$$

\_\_\_\_\_ 3 points

2. Solve:  $\frac{3x-2}{2} + 3 = \frac{5x-3}{4}$

\_\_\_\_\_ 3 points

3. Solve for  $C$ .  $x = \frac{C - R}{y}$

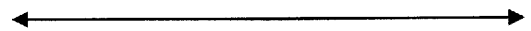
\_\_\_\_\_ 2 points

4. Solve:  $2(2x+1) - 4(x-2) = 6 + 2x$

\_\_\_\_\_ 2 points

5. Solve the inequality. Graph and give the solution set in **interval notation**.

$-\frac{2}{3} < \frac{x+2}{3} \leq 4$  1 point



1 point

\_\_\_\_\_ 1 point

6. Solve the compound inequality. Graph and give the solution set in **interval notation**.

$3x > -3$  or  $2 - x > 7$                       2 points

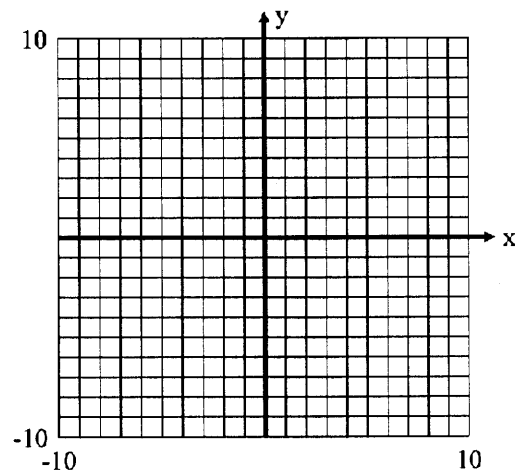
←—————→ 1 point

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1 point

7. Complete the table of ordered pairs for the equation  $2x - 3y = 12$ ; then graph the equation.

3 points

$x$	$y$
0	
	0
	-2



8. Find an equation of the line passing through the points  $(4, 1)$  and  $(-4, -5)$ . **Write your answer in slope-intercept form.**

—————  
3 points

9. Determine whether the lines  $x + 2y = 7$  and  $x - 2y = 7$  are **parallel, perpendicular, or neither**.

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2 points

10. Let  $f(x) = x^2 - 6x + 8$ . Find  $f(-3)$ .

—————  
2 points

11. Solve the system and give the solution in the form  $(x, y)$ :
- $$\begin{aligned}5x + 4y &= -1 \\7x + 6y &= -2\end{aligned}$$

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3 points

12. Tickets for a show cost \$2.00 for adults and \$1.50 for children. A total of 425 individuals bought tickets to the event for a total of \$740. **Write and solve a system of equations to determine how many of each type of ticket were sold.**

5 points total

# of adult tickets: \_\_\_\_\_

# of child tickets: \_\_\_\_\_

13. Simplify the expression. Assume that all variables represent nonzero real numbers.

$$\left(\frac{3x^5}{x^{-2}}\right)^2 \left(\frac{x^{-3}}{36}\right)$$

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3 points

14. Simplify.  $(3x - 2) - (4x^2 - 5x + 2)$

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3 points

15. Find the product.  $(5x+3)(3x-5)$

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3 points

16. Divide:  $\frac{4v^3 - 8v^2 + 3v + 4}{2v + 1}$

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3 points

17. Factor each completely.

a.  $3x^2 + 7x - 20$

a. 

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3 points

b.  $a^2 + a - 5ab - 5b$

b. 

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3 points

c.  $36m^4 - 9$

c. 

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3 points

d.  $y^3 + 27$

d. 

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3 points

18. Simplify.  $(3x-2)^2$

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3 points

19. Solve the equation **by factoring**:  $3x^2 - 8 = -10x$

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3 points

20. Given the function  $f(x) = \frac{x}{x+5}$ ,

a. Find all numbers that are **not** in the domain of the function

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1 point

b. Give the domain in **interval notation**

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2 points

21. Divide. **Write all answers in lowest terms.**

$$\frac{x^2 - x - 6}{x^2 - 7x + 12} \div \frac{x^2 - 3x - 10}{x^2 - 2x - 8}$$

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3 points

22. Add or subtract as indicated. **Write all answers in lowest terms.**

$$\frac{2}{x+y} + \frac{3}{x-y} - \frac{x-3y}{x^2-y^2}$$

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4 points

23. Simplify the complex fraction. Write all answers in lowest terms.

$$\frac{\frac{1}{c^2} - \frac{1}{d^2}}{\frac{1}{c} + \frac{1}{d}}$$

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4 points

24. Solve the equation.

$$\frac{-x^2 + 10}{x^2 - 1} + \frac{3x}{x - 1} = \frac{2x}{x + 1}$$

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3 points

25. Evaluate.  $\left(\frac{8}{27}\right)^{-2/3}$

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2 points

26. Express the radical in **simplified form**. Assume that all variables represent positive real numbers.

$$\sqrt{54x^5y^8}$$

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3 points

27. **Multiply**, and then **simplify** each product.

$$(2\sqrt{3} + 1)(4\sqrt{3} - 3)$$

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3 points

28. **Rationalize** the denominator.

$$\sqrt{\frac{5}{32}}$$

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2 points

29. Solve the equation:

$$\sqrt{3x+1}+1=x$$

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3 points

30. Use the **square root property** to solve the equation and **simplify** the result:

$$x^2 - 18 = 0$$

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2 points

31. Use the **quadratic formula** to solve the equation and **simplify** the result:

$$x^2 + 4x + 1 = 0$$

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3 points

#### Notice

As stated in the University of Southern Indiana Bulletin, a "C" or better in Math 100 is required as a prerequisite to subsequent courses in mathematics. If you are currently pre-registered for Math 106, Math 108, Math 111, Math 112, or Math 118 and do not receive a course grade of "C" or better, you must withdraw from that class and re-enroll in Math 100. If you have attempted Math 100 twice without earning a grade of C or better, then you must enroll in the expanded offering of Math 100/101 for summer or fall. For assistance with schedule adjustment, please contact the Office of the Registrar at (812) 464-1762.