

**Instructions.** (0 points) For the final you will need to show all necessary work to receive full credit. Read the directions for each problem carefully and make sure that you answer all parts of each question. You may use your calculator to check only.

1. Simplify:  $\frac{14}{24} \div \frac{7}{12} \cdot \frac{5}{2}$
2. Simplify:  $\frac{2}{3} - \frac{1}{7} \cdot \frac{5}{2}$
3. If it costs \$8.00 per square foot, how much would it cost to carpet a triangular room with a base of 9 ft. and a height of 13 ft?
4. Calculate the following in two different ways and explain each method:  $7(4 - 3)$
5. A baseball costs \$  $a$  and a glove costs \$  $b$ . Write an expression to represent how much it will cost a community center to buy 12 baseballs and 8 gloves.
6. Find 17% of 457.
7. 72 is what percent of 576?
8. Solve the following equation:  $2(x - 1) + 4 = 4(1 + x) - (2x + 2)$
9. Two cars leave at the same time heading east. One car travels at 42 mph and the other travels at 53 mph. In how many hours will the cars be 82.5 miles apart?
10. A shopkeeper sells chocolate coffee beans for \$7 per pound. A customer asks the shopkeeper to mix 2 pounds of chocolate coffee beans with 5 pounds of hazelnut coffee beans. If the customer paid \$6 per pound for the mixture, what is the price per pound of the hazelnut coffee beans?
11. Solve  $C = \frac{5}{9}(F - 32)$  for  $F$ . Then find  $F(10)$  and  $F(-10)$ .
12. Solve the inequality and state the solution both graphically (on a number line) and in interval notation.  $3(5 - x) \geq 2x$
13. Solve the inequality and state the solution both graphically (on a number line) and in interval notation.  $-9 < 3(x + 2) \leq 3$

14. Algebraically find the  $x$  and  $y$  intercepts for the equation  $x - y = -3$ . Use the intercepts to sketch an accurate graph of the function.

15. Solve the following system by your method of choice:

$$\begin{aligned}x + y &= 3 \\ 3x &= 2 - y\end{aligned}$$

16. Solve the following system by your method of choice:

$$\begin{aligned}y - 2x &= 4 \\ 4x + 8 &= 2y\end{aligned}$$

17. Algebraically find the  $x$  and  $y$  intercepts of  $3x + 5y = 15$ . Use the intercepts to sketch an accurate graph of the function.

18. The perimeter of a rectangular garden is 70 meters. The width of the garden is two-thirds its length. Find the length of the garden.

19. Simplify:  $-3^5$

20. Simplify:  $\left(\frac{-x^{-2}y^3}{x^{-3}y^2}\right)^2$

21. Simplify:  $\left(\frac{4(x^{-2}yz)^{-2}}{(2x^{-3}z^0)^4}\right)^2$

22. Determine if the following expression is a polynomial. If it is, state whether it is a monomial, binomial, or trinomial and state the degree.  $ax^2 - 2x^{1/2}$

23. Determine if the following expression is a polynomial. If it is, state whether it is a monomial, binomial, or trinomial and state the degree.  $4x^2t^4 - 2x^2t^3 - 11x^7$

24. Simplify:  $-6(x - y) + 2(x + y) - 3(x + 2y)$

25. Expand and simplify:  $(3a - 2)^2$

26. Expand and simplify:  $(3a - 2)(3a + 2)$

27. Expand and simplify:  $(4x + 2a)(7a^2 - 2xa - 3x^2)$

28. Simplify:  $-2x(2x - 3)(2x^2 - 2x + 4)$

29. Simplify:  $\frac{15a^2bc + 20ab^2c - 25abc^2}{-5abc}$

30. Divide:  $\frac{-13x - 4 + 9x^3}{3x + 1}$

31. Factor:  $2a^2x + 2abx + a^3 + a^2b$

32. Factor:  $ax^6 - ay^6$

33. Factor:  $4x^2 - 4$

34. Factor:  $-y^2 + 10y - 21$

35. Factor:  $24 + 6x^2 - 30x$

36. Solve:  $9y^2 = 64$

37. Solve:  $(a + 1)(6a^2 + a - 2) = 0$

38. One positive integer is 2 more than another. Their product is 35. Find the integers.