

Final Test — Form A

HSA.REI

HSA.SSE

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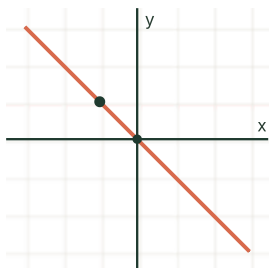
HSF.LE

HSN.RN

Name _____ Date _____

Algebra 1 final — all topics. Show your work and write each answer in simplest/exact form.

1. Solve for x : $3(2x - 4) = 18$.
2. Simplify the expression $5x - 3(x - 4) + 2$.
3. Solve the inequality and write the solution: $-2x + 5 \leq 11$.
4. Solve the literal equation for h : $A = \frac{1}{2}bh$.
5. Find the slope of the line through the points $(2, 1)$ and $(6, 9)$.
6. Simplify, writing the answer with positive exponents: $\frac{12x^5y^2}{3x^2y^6}$.
7. Simplify using exponent rules: $(2x^3)^4$.
8. Write the equation of the line, in slope-intercept form, with slope -3 that passes through the point $(2, 4)$.
9. Simplify the radical: $\sqrt{72}$.
10. Multiply the polynomials: $(x + 5)(x - 3)$.
11. Simplify: $(2x^2 + 5x - 1) - (x^2 - 3x + 4)$.
12. Identify the equation of the line graphed below.



13. Solve the system by substitution: $\begin{cases} y = 2x - 1 \\ 3x + y = 9 \end{cases}$

14. Solve the system by elimination: $\begin{cases} 2x + 3y = 12 \\ 2x - y = 4 \end{cases}$

15. Factor completely: $x^2 + 7x + 12$.

16. Which is the complete factorization of $x^2 - 49$?

A) $(x - 7)^2$

B) $(x + 7)(x - 7)$

C) $(x + 7)^2$

D) $(x - 49)(x + 1)$

17. Solve by factoring: $x^2 - 5x - 14 = 0$.

18. For the function $f(x) = x^2 - 4x + 1$, find $f(3)$.

19. A relation is given by the set of points $\{(1, 2), (3, 5), (4, 5), (6, 8)\}$. State its domain and range.

20. Solve using the quadratic formula. Give exact answers in simplest radical form: $x^2 - 6x + 4 = 0$.

21. How many real solutions does $x^2 + 2x + 5 = 0$ have? Justify with the discriminant.

22. Which sequence is arithmetic?

A) 2, 6, 18, 54, ...

B) 5, 8, 11, 14, ...

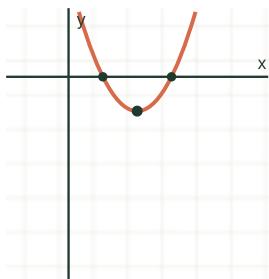
C) 1, 4, 9, 16, ...

D) 3, 6, 12, 24, ...

23. An arithmetic sequence has first term 4 and common difference 3. Write a formula for the n th term a_n , then find a_{10} .

24. A geometric sequence has first term 5 and common ratio 2. Write a formula for the n th term a_n , then find a_6 .

25. The parabola $y = x^2 - 4x + 3$ is graphed below. State the coordinates of the vertex and the equation of the axis of symmetry.



26. A gym membership costs a \$40 sign-up fee plus \$25 per month. Write a linear equation for the total cost C after m months, then find the cost after 8 months.
27. A new bicycle costs \$500 and loses 10% of its value each year. Write an exponential model for its value V after t years, then find its value after 2 years.
28. A soccer ball is kicked upward. Its height in feet after t seconds is $h = -16t^2 + 32t$. How many seconds until the ball lands back on the ground ($h = 0$)?