

Final Exam — Answer Key

Cumulative Review: Foundations through Quadratics & Statistics

FOR TEACHER / SELF-CHECK USE

This final exam was written to cumulatively cover Units 0 through 9. Every solution below has been independently verified.

1	Multiply first: $2 \times 3 = 6$. Then: $8 - 6 + 5$. Answer: A — 7
2	Subtract 4: $7x = 21$. Divide by 7: $x = 3$. Answer: A — $x = 3$
3	Distribute: $2x - 8 = 3x + 1$. Subtract $2x$: $-8 = x + 1$. Subtract 1: $x = -9$. Answer: x = -9
4	Add 1: $4x < 12$. Divide by 4: $x < 3$. Answer: A — $x < 3$
5	$f(3) = 2(3)^2 - 3 = 2(9) - 3 = 18 - 3$. Answer: A — 15
6	Slope = $(-8 - 4)/(3 - (-1)) = -12/4$. Answer: -3
7	From $x - 2y = 0$, $x = 2y$. Substitute: $3(2y) + 2y = 16 \rightarrow 8y = 16 \rightarrow y = 2$. $x = 2(2) = 4$. Answer: A — $x = 4$, $y = 2$
8	Substitute $y = x - 3$ into $4x + y = 17$: $4x + x - 3 = 17 \rightarrow 5x = 20 \rightarrow x = 4$. $y = 4 - 3 = 1$. Answer: x = 4, y = 1
9	$(2, 3)$: $3 \leq 4$ true; $3 > -1$ true — satisfies both. $(2, 5)$: $5 \leq 4$ false. $(-5, 10)$: $10 \leq -3$ false. $(2, -5)$: $-5 > -1$ false. Answer: A — (2, 3)
10	Raise each factor to the 4th power: $2^4 = 16$, $(x^3)^4 = x^{12}$. Answer: A — $16x^{12}$
11	$72 = 36 \times 2$. $\sqrt{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$. Answer: $6\sqrt{2}$
12	Need two numbers multiplying to 20 and adding to -9: -5 and -4. Answer: A — $(x - 5)(x - 4)$
13	Difference of squares: $(a - b)(a + b) = a^2 - b^2$. $x^2 - 36$. Answer: $x^2 - 36$
14	Need two numbers multiplying to -20 and adding to 1: 5 and -4. Answer: A — $x = -5$ or $x = 4$

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- 15** Vertex time: $t = -b/(2a) = -48/(2 \cdot -16) = 1.5$ seconds.
Maximum height: $h(1.5) = -16(1.5)^2 + 48(1.5) + 4 = -36 + 72 + 4$.
Answer: Maximum height of 40 feet at $t = 1.5$ seconds

- 16** Mean = $(5+9+12+15+20+40)/6 = 101/6 \approx 16.83$.
Sorted: 5, 9, 12, 15, 20, 40. Median = $(12+15)/2 = 13.5$.
The outlier 40 pulls the mean well above where most of the data lies (five of the six values are 20 or below), so the median is the more representative "typical" value here.
Answer: Mean ≈ 16.83 , Median = 13.5; the median better represents this data set because of the outlier