



# Algebra 2 Final Exam

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This exam is comprehensive over the entire course and includes 12 questions. You have 60 minutes to complete the exam.

The exam is worth 100 points. The 8 multiple choice questions are worth 5 points each (40 points total) and the 4 free response questions are worth 15 points each (60 points total).

Mark your multiple choice answers on this cover page. For the free response questions, show your work and make sure to circle your final answer.

1. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
2. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
3. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
4. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
5. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
6. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
7. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
8. (5 pts)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E



1. **(5 pts)** Two numbers  $a$  and  $b$  have a ratio of 6 to 5, and a difference of 6. What is the larger of the two numbers?

**A** 5

**C** 15

**E** 36

**B** 6

**D** 30

2. **(5 pts)** Simplify the expression, making sure to rationalize the denominator.

$$\sqrt{\frac{7}{36}} + \sqrt{\frac{13}{39}}$$

**A**  $\sqrt{3} + \sqrt{7}$

**D**  $\frac{2\sqrt{3} + \sqrt{7}}{6}$

**B**  $6\sqrt{7}$

**E**  $\frac{2\sqrt{3} - \sqrt{7}}{6}$

**C**  $\frac{19\sqrt{3}}{6}$



3. (5 pts) Solve for  $x$ .

$$\frac{\frac{2}{5}}{\frac{3}{8}} = \frac{\frac{x}{9}}{\frac{5}{3}}$$

☐ A  $x = 16$

☐ C  $x = 2$

☐ E  $x = -16$

☐ B  $x = 5$

☐ D  $x = -15$

4. (5 pts) A computer is normally listed for \$1,499, but it's on sale for \$1,200. What is the percent markdown?

☐ A 25 %

☐ C 20 %

☐ E 19.25 %

☐ B 24.92 %

☐ D 19.95 %



5. (5 pts) Simplify the rational function to lowest terms.

$$\frac{(3x^3 + x^2 - 10x)(x^2 + x - 12)}{(2x^2 + 3x - 2)(3x^2 + 7x - 20)}$$

**A**  $\frac{x-3}{2x-1}$

**C**  $\frac{x(2x-1)}{x-3}$

**E**  $\frac{x(x+2)(x-3)}{(2x-1)(x+4)}$

**B**  $\frac{x(x-3)}{2x-1}$

**D**  $\frac{x(x-3)}{(2x-1)(x+4)}$

6. (5 pts) Solve the equation for  $b$ .

$$\frac{c}{d} - \frac{a}{b} = \frac{e}{f}$$

**A**  $a\left(\frac{c}{d} - \frac{e}{f}\right)$

**C**  $\frac{a}{\frac{c}{d} - \frac{e}{f}}$

**E**  $\frac{\frac{c}{d} - \frac{e}{f}}{a}$

**B**  $a\left(\frac{e}{f} - \frac{c}{d}\right)$

**D**  $\frac{a}{\frac{e}{f} - \frac{c}{d}}$



7. (5 pts) Write the expression as a single logarithm.

$$\log 8x + 3 \log x - \log 2x^2$$

**A**  $\frac{\log 8x + 3}{2x^2}$

**C**  $\log 8x^6$

**E**  $\frac{\log 4 + 3}{x}$

**B**  $\log 4x^2$

**D**  $\log 24x - x^2$

8. (5 pts) Simplify the imaginary expression.

$$4i^5 - \sqrt{-9} + 4i^7 - 12i^4 + \sqrt{-16} - 7i^6 + 5i^2$$

**A**  $7i - 10$

**C**  $-i - 12$

**E**  $i - 10$

**B**  $7i - 12$

**D**  $-i - 10$



9. **(15 pts)** The product of the digits of a certain two-digit number is 24. Reversing the digits gives a number which is 45 greater than the original number. What is the original number?

10. **(15 pts)** Solve the equation for  $x$ .

$$\sqrt{5 + 4x} - x = 0$$



11. **(15 pts)** What is the equation of a circle, in expanded form, with center at  $(0,2)$  and diameter of 8 units?

12. **(15 pts)** An amusement park charges \$40 for children and \$60 for adults. On a particular day, 2,400 people came to the amusement park. Write an equation that gives the number of children  $c$  that were at the amusement park that day, in terms of  $T$ , the total amount of money taken in by the park.

