

1. **Simplify** and write with only **positive** exponents

(5 points)

(a) $(2x^{-3}y^4)^{-4}$

(10 points)

(b) $\frac{(a^3b^{-4})^{-3}}{(a^{-2}b^{-1})^{-2}}$

(2 points)

2. Find the **degree** of the polynomial $3x^2yz - 2xy^2z^2 + z^5$

(6 points)

3. Given the two polynomials $5x^2 - 2x + 1$ and $2x^2 - 5x + 6$ find their **difference**.

4. Find the products

(5 points)

(a) $(3x + 5)(4x - 9)$

(10 points)

(b) $(2x + 5)(2x^2 - 5x + 3)$

(10 points)

5. **Expand** $(3x + 4)^3$ and simplify.

(5 points)

6. Write the **product** in **scientific notation**. $(4.5 \times 10^{25}) \times (8 \times 10^{-87})$

(10 points)

7. Find the **quotient** using **synthetic division**

$$x + 1 \overline{) 2x^2 - 3x - 5}$$

(8 points)

8. **Factor** $x^2 + 9x + 20$

(10 points)

9. **Factor** $12x^2 - 16x - 35$

(10 points)

10. **Factor** $20x^3 + 8x^2 - 45x - 18$

11. Given the parabola $y = 2x^2 - 3x - 5$

(2 points) (a) find the (x, y) -coordinates of the point of intersection with the y -axis

(8 points) (b) find the (x, y) -coordinates of the **vertex**

(6 points) (c) complete the table

x	-2	-1	0	1	2	3	
y							

(7 points) (d) then draw a **graph** of the function, including all of the above points.

12. Given the function $y = x^3 - 4x$

(5 points) (a) complete the table, to find coordinates of points on the graph

x	-3	-2	-1	0	1	2	3
y							

(6 points) (b) then draw a **graph** of the function, including the points from part (a).

(10 points) 13. **Factor** $24x^4 - 81xy^3$

(10 points) 14. **Solve the equation** $x^2 = 2x + 35$

(10 points) 15. **Solve the equation** $6x^2 + 13x - 15 = 0$

(10 points) 16. A stone is thrown downward at 32 ft/sec, from the top of a 308 ft cliff.
Ignoring air resistance, its height above the ocean below the cliff is given by

$$s = 308 - 32t - 16t^2$$

How many seconds after it is thrown does it hit the ocean?

- (10 points) 17. **Graph** the **system** of inequalities, giving the (x, y) -coordinates of all **vertices** of the solution set.

$$x \geq 0, y \geq 0, x + y \leq 7, 2x + 3y \leq 18$$

(10 points) 18. Simplify $\frac{x + 2}{x^2 - 4x - 21} + \frac{3 - x}{x^2 + 5x + 6}$

(10 points) 19. Simplify $\frac{x^2 + 4x}{x^2 - 4x - 21} \cdot \frac{x^2 + 5x + 6}{x^2 - 16}$

(8 points) 20 Simplify $\frac{a^2b^4}{x^2} \div \frac{a^3b}{x^3}$

(4 points) 21. For what values of x is $\frac{x + 2}{x^2 - 4x - 21}$ defined?

(10 points) 22. Simplify $\frac{\frac{2}{x+1} - \frac{1}{x-1}}{\frac{1}{x^2-1} + 1}$

(12 points) 23. **Solve** $\frac{x+1}{x^2-9} - \frac{x-1}{x^2+3x} = \frac{1}{x}$

INTERMEDIATE ALGEBRA TEST TWO SAMPLE QUESTIONS. ACTUAL TEST MAY DIFFER.
SHOW ALL CALCULATIONS AND SIMPLIFY ANSWERS. PAGE 4 OF 4.

(4 points) 24. Simplify $\sqrt{108}$

(10 points) 25. Rosa can mow her lawn in 30 minutes. Rosa and Claudia can mow the lawn together in 12 minutes. How long would it take Claudia to mow the lawn, Working alone? Set up an appropriate equation, solve it, check, and answer with a sentence. Round to the nearest tenth of a minute if necessary.

(10 points) 26. A boat travels 9 miles down a river, and returns, with a round trip travel time of 6.25 hours. The speed of the current is 0.6 miles per hour. **Find the speed of the boat in still water.** Use proper word problem procedure, including an appropriate equation, check and sentence answer.

(4 points) 27. y varies **inversely** as x . If y is 4 when x is 3, find y when x is 5.

(10 points) 28. Solve by **completing the square**: $x^2 - 10x + 6 = 0$
Write solutions with simplified radicals.

(10 points) 29. Solve by using the **quadratic formula**: $3x^2 - 10x + 6 = 0$
Write solutions with simplified radicals.

(100 points total on actual test.)