

MAT 152B Beginning Algebra**Final Exam**

1. (3 points) Solve $A = \frac{1}{2}h(a+b)$ for h .

2. (3 points) The perimeter of a rectangle is 80 feet. The length is 30 feet. Find the width. Show the full equation for full credit.

3. (4 points) Find the variation constant and write a formula that expresses the given variation: y varies directly as x , and $y = 7$ when $x = 5$. Find y when $x = -3$.

4. (3 points) Factor.

$$21x^5y^3 + 35x^4y^4 - 56xy^7$$

5. (3 points) Factor.

$$mp - 4dp - 4m^2 + 16md$$

6. (3 points) Factor.

$$8x^3 + 27m^6$$

7. (3 points) Factor.

$$x^4 - 16x^3 + 64x^2$$

8. (4 points) Factor $x^3 + 6x^2 - 7x - 60$ completely. Use the information that $x + 5$ is one of the factors.

9. (3 points) Solve. $m^2 - 5m = 24$

10. (2 points) Reduce to lowest terms. $\frac{-8x^7y^{19}}{20x^9y^{13}}$

11. (3 points) Reduce to lowest terms. $\frac{2x-8}{-3x^2+3x+36}$

12. (3 points) Perform the indicated operation. $\frac{9-m^2}{m^2+m} \div \frac{m-3}{m^2-1}$

13. (5 points) Simplify the complex fraction. $\frac{\frac{1}{x-2} - \frac{2}{x+2}}{\frac{3}{x-2} + \frac{4}{x+2}}$

14. (4 points) Solve the equation. $\frac{1}{x-1} + \frac{2}{x} = \frac{x}{x-1}$

15. (3 points) Solve the equation. $\frac{x}{3} = \frac{x+1}{4}$

16. (3 points) If three out of five copying customers prefer peach paper, then when there are 385 copying customers in a week, how many in a week prefer peach paper?

17. (3 points) Solve by graphing.

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

18. (3 points) Solve by any method.

$$\begin{aligned}x - y &= 3 \\ 3x - 2y &= 4\end{aligned}$$

19. (3 points) Graph the system of inequalities.

$$\text{or } \begin{cases} y > x + 2 \\ y < -4x + 3 \end{cases}$$

20. (3 points) Solve and state the answer in interval notation. $\left|1 - \frac{x}{5}\right| > \frac{8}{5}$

21. (3 points) Simplify the radical. $\sqrt[4]{48x^{14}}$

22. (3 points) Simplify. $\sqrt[3]{\frac{a^5}{x}}$

23. (3 points) Simplify. $\frac{\sqrt{2} + \sqrt{15}}{\sqrt{5} - \sqrt{3}}$

24. (3 points) Solve the equation. $(x-4)^3 = -125$

25. (4 points) Solve. $\sqrt{2x^2 - 6x - 16} = x$

26. (3 points) Solve. $x^2 + 18 = 0$

27. (4 points) Solve by completing the square. $x^2 - 3x - 6 = 0$

28. (4 points) Use the quadratic formula to solve the equation.

$$x^2 + 10x - 3 = 0$$

29. (3 points) Solve. $x^{-\frac{2}{3}} = 3$

30. (3 points) Simplify. $\left(-\frac{81}{121}\right)^{-\frac{1}{2}}$

Bonus #1 (1 point possible) Simplify. i^{106}

Bonus #2 (1 point possible) Find the quotient. $\frac{4+7i}{3-2i}$