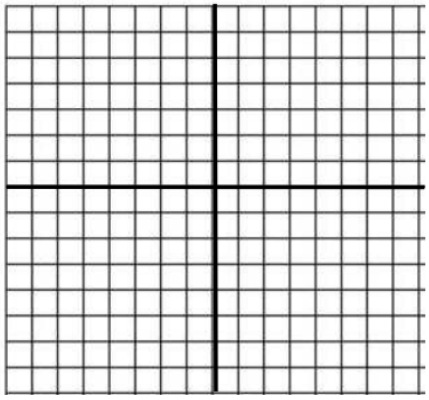
Name: **Show all work. No calculators.** Time:

1. Use the quadratic formula to solve this equation:

$$3x^2 - 2x + 1 = 0$$

2. (a) Graph the equation $y = x^2 - 2x + 1$. (b) Find the coordinates of the points of intersection between $y = x^2 - 2x + 1$ and $y = 4$. (c) Shade the region determined by $y > x^2 - 2x + 1$ and $y < 4$.



3. Find all pairs (x, y) that satisfy both of the following equations simultaneously:

$$2x + 3y = 5$$
$$x - 2y = 8$$

4. Simplify:

$$\sqrt{\frac{3}{2}} + 4\sqrt{\frac{2}{3}} + \sqrt{24}$$

5. Solve for x:

$$x^{\frac{2}{3}} = 4$$

6. Solve for x:

$$\frac{5}{6} + \frac{3}{x+2} = \frac{2}{3}$$

7. Simplify:

$$\frac{x^3 - 16x - 6x^2}{x^2 - 8x - 20} \times \frac{-50 - 5x + x^2}{x^3 - 5x^2 - 24x}$$

8. Find three consecutive integers such that the product of the first and the second is equal to the product of - 6 and the third.

9. How many different ways can all four of the letters A, B, C, and D be ordered if no repetition is allowed?

10. Find the equation of the line that passes through (2, 1) and is perpendicular to $2x - 3y = 6$.

11. Simplify:

$$\sqrt[5]{16\sqrt{2}}$$

12. convert the rectangular coordinates -8R + 17U (-8i +17j) to polar form.

$$-8R+17U$$

13. Solve by factoring:

$$14x^3 = 42x - 7x^2$$

14. Solve:

$$\sqrt{x}+2=\sqrt{x+12}$$

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15. Factor:

$$27x^3y^6 - a^9c^{12}$$

16. Expand:

$$(a^{3/2}+c^{1/4})^2$$

17. Find $fg(2)$ if $f(x)=(x-1)^2; D=\{Reals\}$ and $g(x)=x+3; D=\{Integers\}$.

18. Simplify:

$$\frac{4i-3i^2-2}{\sqrt{-25}-\sqrt{-3}\sqrt{-3}}$$

19. Solve.

$$\begin{cases} x+2y+z=7 \\ 3x-y+z=-12 \\ 4x+3y-2z=9 \end{cases}$$

20. Complete the square.

$$y=-x^2+4x+1$$

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The End