

MATH 120
SPRING 2023
EXAM 1

NAME:

- 5 pts. each List the quadrants satisfying each condition, or state that no quadrant works.

 - $y/x < 0$
 - $x < 0$ and $xy^2 > 0$
- 10 pts. Graph $y = -\frac{1}{2}|x|$, letting $x = -4, -2, 0, 2, 4$.
- 10 pts. each Find the solution set of each equation.

 - $5x - (2 - 2x) = x + (3x - 5)$
 - $\frac{6}{x+3} - \frac{5}{x-2} = \frac{-20}{x^2+x-6}$
- 15 pts. You invested \$4000. On part of this investment you earned 4%. On the remainder of the investment, you lost 3%. Combining earnings and losses, the annual income from the two investments was \$55. How much was invested at each rate?
- 10 pts. Solve $A = 2lw + 2lh + 2wh$ for h .
- 10 pts. each Express each in the standard form $a + bi$.

 - $(5 - 2i)^2$
 - $\frac{4 + i}{2 - i}$
- 5 pts. Do a long division that quickly determines whether i^{877} equals 1, -1 , i , or $-i$.
- 10 pts. each Solve each by the method indicated.

 - $2(x - 6)^2 = 98$ by the square root property
 - $2x^2 + 8x + 1 = 0$ by completing the square
- 15 pts. A piece of wire is 8 meters long. The wire is cut into two pieces and then each piece is bent into a square. Find the length of each piece if the sum of the areas of the two squares is 2 square meters.

10. 10 pts. each Solve each equation.

(a) $\sqrt{2x - 3} - \sqrt{x - 2} = 1$

(b) $2x^{2/3} + 7x^{1/3} - 15 = 0$

(c) $|2x - 1| + 7 = 16$

11. 10 pts. each Solve each inequality, stating the solution set in interval notation when appropriate.

(a) $7 - \frac{4}{5}x \leq \frac{3}{5}$

(b) $|5 - 2(x - 1)| > 4$

(c) $-3|x + 7| \geq -27$