

Quiz 7

Name: Key

Total Points possible: 11 out of 10

Math 12: Spring 2025

Instructions: Each question is worth 3 points but the last question. Question 4 and 5 are worth 1 point.
Show all your work in order to receive credit.

Problem 1. (3 points) Distribute and simplify.

$$\begin{aligned}
 \text{(a)} \quad & -4x^3 - x(3x^2 + 7) + x + (2 + 10x^2) \\
 & \underline{-4x^3} - \underline{3x^3} - \underline{7x} + \underline{x} + \underline{2} + \underline{10x^2} \\
 & -7x^3 - 6x + 2 + 10x^2
 \end{aligned}$$

Problem 2. (3 points) Factor (by grouping). $\underline{25c - c^2} + \underline{25r - c^2}$

$$\begin{aligned}
 & 25c - c^2 - cr + 25r \\
 & c(25 - c) + r(-c + 25) \\
 & c(25 - c) + r(25 - c) \\
 & (c + r)(25 - c)
 \end{aligned}$$

Problem 3. (3 points) Factor $y^4 - 1$

recall $(y^2 - x^2) = (y+x)(y-x)$

$$(y^2)^2 - 1^2 = (y^2 - 1)(y^2 + 1) \quad \text{use diff of squares}$$

$$= (y-1)(y+1)(y^2 + 1) \quad \text{again}$$

Problem 4. (1 points) **Extra credit.** Simplify the complex fraction into one.

$$\frac{\frac{4}{b}}{\frac{5}{b} + \frac{6}{a}}$$

want to add these
make bottom the same

$$\frac{\frac{4}{b}}{\frac{5}{b} + \frac{6}{a} \cdot \frac{b}{b}} = \frac{\frac{4}{b}}{\frac{5a}{ab} + \frac{6b}{ab}} = \frac{\frac{4}{b}}{\frac{5a+6b}{ab}}$$

keep

$$= \frac{4}{b} \div \frac{5a+6b}{ab} \quad \text{change}$$

flip

$$= \frac{4}{b} \cdot \frac{ab}{5a+6b}$$

$$= \frac{4a}{5a+6b}$$

Problem 5. (1 points) **Extra credit.** Let's see how logical you truly are. Are the following two statements logically the same?

- If P then Q
- If the cat has a big pouch then the cat is fat.
 - If the cat is not fat then the cat does not have a big pouch.
- If not Q then not P

These are the same logically

$$\Rightarrow P \Rightarrow Q \text{ same as}$$

$$\neg Q \Rightarrow \neg P$$