

MATH 118: Quiz 3

Name: Key

Directions:

- * Show your thought process (commonly said as "show your work") when solving each problem for full credit.
- * If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- * Good luck!

1. Isolate the variable x in the equation

goal: $x = \dots$

$$\left(\frac{x^2}{x}\right) + 3x + 4(ax + b) = -2$$

collect terms with x on one side

$$\frac{x^2}{x} = \frac{\cancel{x} \cdot \cancel{x}}{\cancel{x} \cdot 1} = x$$

$$\overbrace{x} + \overbrace{3x} + \overbrace{4ax} + 4b = -2$$

$$ \quad \quad \quad -4b \quad -4b$$

$$4x + 4ax = -2 - 4b$$

$$x \cdot \underbrace{(4 + 4a)}_{4 + 4a} = \underbrace{-2 - 4b}_{4 + 4a}$$

GCF

$$x = \frac{\cancel{2}(-1 - 2b)}{\cancel{2}(2 + 2a)}$$

$$x = \frac{-1 - 2b}{2 + 2a}$$

2. Find **all** real-valued solutions of the equation

$$4x^2 - x = 0$$

quadratic, need factors.

By GCF

$$x \cdot (4x - 1) = 0$$

$x = 0$

$4x - 1 = 0$
 $4x = 1$
 $x = \frac{1}{4}$

3. Multiply the following:

$$(1+i)^2$$

Make sure your answer is in $a + bi$ form.

$$(1+i)^2 = (1+i)(1+i)$$

$$\stackrel{\text{dist}}{=} (1+i) \cdot 1 + (1+i) \cdot i$$

$$\stackrel{\text{dist}}{=} 1 + i + i + i^2$$

$$= 1 + 2i - 1$$

$$= \boxed{2i}$$