

**COT 3100 Quiz #2: d = rt, logs (Week of Mar 20, 2023) – R, F Version**

**Last Name:** \_\_\_\_\_ **First Name:** \_\_\_\_\_

**Circle Rec:**            **R10:30am**            **R4:30pm**            **F11:30am**

1) (8 pts) Let  $x$  and  $y$  be positive integers such that  $xy + 3x + 4y = 209$ , with  $x < 10$  and  $y < 20$ , with proof (without exhaustive search), find  $x$  and  $y$ . (Note: As a hint, when you solve this problem, you should run into factoring  $221 = 13 \times 17$ .)

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2) (7 pts) Josie buys 3 apples and 5 oranges for \$5.08. Later, she buys 2 apples and 1 orange for \$1.52. How much would Josie have spent if she bought 1 apple and 2 oranges?

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3) (10 pts) Let  $r$  and  $s$  be roots of the quadratic equation  $x^2 - 6x + 17 = 0$ . What is the quadratic equation with leading coefficient **17** which has the roots  $(r + \frac{1}{s})$  and  $(s + \frac{1}{r})$ ? (Note: Once you start working out the problem, you'll see why I asked for a leading coefficient of 17...)