

MATH 1310

Test 2 Review (Alternate)

10 Multiple Choice Questions (60 points: Test 2)

4 Free Response Questions (40 points: Test 2 FR)

CD: $6x$

$$2 \cdot \frac{5}{3x} - \frac{7 \cdot 3}{2x} = 5 \cdot \frac{6x}{1 \cdot 6x}$$

$$\frac{10}{\cancel{6x}} - \frac{21}{\cancel{6x}} = \frac{30x}{\cancel{6x}}$$

$$10 - 21 = 30x$$

$$\frac{-11}{30} = \frac{\cancel{30}x}{\cancel{30}}$$

$$\boxed{\frac{-11}{30} = x}$$

$$\frac{8 - \sqrt{-16}}{\sqrt{-9} \cdot \sqrt{-4}}$$

$$\frac{8 - 4i}{3i \cdot 2i} = \frac{8 - 4i}{6i^2} \rightarrow -1$$

$$\frac{8 - 4i}{-6}$$

$$-\frac{8}{6} + \frac{4}{6}i = -\frac{4}{3} + \frac{2}{3}i$$

$$2x^2 + 2x - 15 = 10x + 49$$

$$\begin{array}{r} -10x \quad -49 \quad -10x \quad -49 \\ \hline \end{array}$$

$$\frac{2x^2 - 8x - 64}{2} = \frac{0}{2}$$

$$x^2 - 4x - 32 = 0$$

$$(x - 8)(x + 4) = 0$$

$$x - 8 = 0$$

$$x = 8$$

$$x + 4 = 0$$

$$x = -4$$

or $\{-4, 8\}$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$|2x + 6| - 7 \geq 8$$

+7 +7

$$|2x + 6| \geq 15$$

if less than:
 $-15 \leq 2x + 6 \leq 15$

$$2x + 6 \leq -15$$

or

$$2x + 6 \geq 15$$

$$\frac{2x}{2} \leq \frac{-21}{2}$$

$$x \leq -\frac{21}{2}$$

or

$$\frac{2x}{2} \geq \frac{9}{2}$$

$$x \geq \frac{9}{2}$$

$(-\infty, -\frac{21}{2}] \cup [\frac{9}{2}, \infty)$

$$\left| \frac{1}{2}x + 7 \right| - \frac{5}{3} = \frac{7}{3} \quad *$$

$$\left| \frac{1}{2}x + 7 \right| - \frac{5}{3} = \frac{7}{3}$$

$$+ \frac{5}{3} \quad + \frac{5}{3}$$

$$\left\{ -\frac{94}{3}, \frac{10}{3} \right\}$$

$$\left| \frac{1}{2}x + 7 \right| = \frac{26}{3}$$

$$6 \times \left(\frac{1}{2}x + 7 = \frac{26}{3} \right) \cdot 6 = 2$$

$$\begin{array}{r} 3x + 42 = 52 \\ -42 \quad -42 \\ \hline 3x = 10 \end{array} \quad x = \frac{10}{3}$$

$$6 \times \left(\frac{1}{2}x + 7 = -\frac{26}{3} \right) \cdot 6$$

$$\begin{array}{r} 3x + 42 = -52 \\ -42 \quad -42 \\ \hline 3x = -94 \end{array} \quad x = -\frac{94}{3}$$

$$x^4 + 2x^2 - 35 = 0$$

$$\boxed{u = x^2}, \quad u^2 = (x^2)^2 = x^4$$

$$u^2 + 2u - 35 = 0$$

$$(u + 7)(u - 5) = 0$$

$$u + 7 = 0$$

$$u = -7$$

$$u - 5 = 0$$

$$u = 5$$

$$\sqrt{x^2} = \sqrt{-7}$$

$$\sqrt{x^2} = \sqrt{5}$$

$$x = \pm i\sqrt{7}$$

$$x = \pm \sqrt{5}$$

$$2x + 7y = 9$$

$$x - 4y = 2$$

$$\begin{array}{r} x - 4y = 2 \\ +4y \quad +4y \\ \hline \end{array}$$

$$x = 4y + 2$$

$$x = 4\left(\frac{1}{3}\right) + 2$$

$$x = \frac{4}{3} + \frac{6}{3}$$

$$x = \frac{10}{3}$$

$$2x + 7y = 9$$

$$2(4y + 2) + 7y = 9$$

$$8y + 4 + 7y = 9$$

$$\begin{array}{r} 15y + 4 = 9 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} 15y = 5 \\ \frac{15}{15} \quad \frac{5}{15} \\ \hline \end{array}$$

$$y = \frac{1}{3}$$

$$\left(\frac{10}{3}, \frac{1}{3}\right)$$

$$|x + 8| + 4 \leq 2$$

$$|x + 8| \leq -2$$

No Solution

$$8 \leq 3x - 5 < 73$$

+5-

+5-

+5-

$$\frac{13}{3} \leq \frac{3x}{3} < \frac{78}{3}$$

$$\frac{13}{3} \leq x < 26$$

$$\left[\frac{13}{3}, 26 \right)$$

$$\begin{aligned} \frac{78}{3} &= \frac{60}{3} + \frac{18}{3} \\ &= 20 + 6 \\ &= 26 \end{aligned}$$

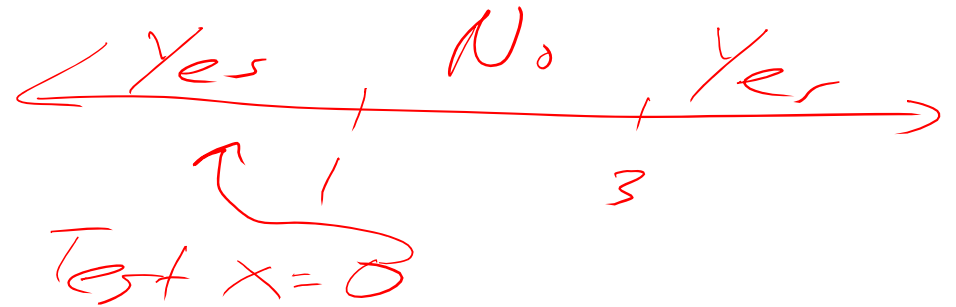
$$x^2 - 4x + 3 \geq 0$$

$$x^2 - 4x + 3 = 0$$

$$(x-3)(x-1) = 0$$

$$x-3=0 \quad x-1=0$$

$$x=3 \quad x=1$$



$$0^2 - 4(0) + 3 \geq 0$$

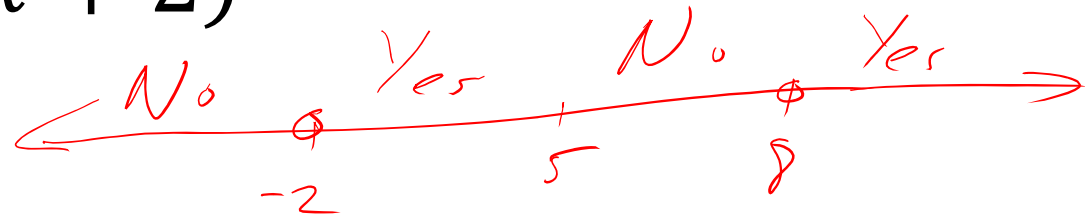
$$3 \geq 0 \quad \text{Yes}$$

$$(-\infty, 1] \cup [3, \infty)$$

$$\frac{x - 5}{(x - 8)(x + 2)} \geq 0 \quad (-2, 5] \cup (8, \infty)$$

Numer:

$$\begin{aligned} x - 5 &= 0 \\ x &= 5 \end{aligned}$$



Den:

$$\begin{aligned} x - 8 &= 0 \\ x &= 8 \end{aligned}$$

Test $x = -3$: $\frac{-3-5}{(-3-8)(-3+2)} = \frac{N}{N \cdot N} = N < 0$

Test $x = 0$: $\frac{0-5}{(0-8)(0+2)} = \frac{N}{N \cdot P} = P > 0$

Test $x = 6$: $\frac{(6-5)}{(6-8)(6+2)} = \frac{P}{N \cdot P} = N < 0$

Test $x = 10$: $\frac{10-5}{(10-8)(10+2)} = \frac{P}{P \cdot P} = P > 0$

Solve by Completing the Square:

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$$x^2 - 12x + 44 = 0$$

$$-44 \quad -44$$

$$x^2 - 12x = -44 \longrightarrow x^2 - 12x + 36 = -44 + 36$$

$$b = -12$$

$$\frac{b}{2} = -6$$

$$\left(\frac{b}{2}\right)^2 = 36$$

$$\sqrt{(x-6)^2} = \sqrt{-8}$$

$$x-6 = \pm 2\sqrt{2}i$$

$$x-6 = \pm 2i\sqrt{2}$$

$$x = 6 \pm 2i\sqrt{2}$$

$$\frac{-2|x+4|}{-2} \leq \frac{12}{-2}$$

$$|x+4| \geq -6$$

$$(-\infty, \infty)$$

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$$\sqrt{x + 11} - 5 = x$$

$$(\sqrt{x + 11})^2 = (x + 5)^2$$

+5 +5

check $x = -7$

(x+5)(x+5)

$$\sqrt{-7 + 11} - 5 = -7$$

$$x + 11 = x^2 + 5x + 5x + 25$$

$$\sqrt{4} - 5 = -7$$

$$2 - 5 = -7$$

$$x + 11 = x^2 + 10x + 25$$

$$\begin{array}{r} -x - 11 \\ \hline \end{array}$$

$$\begin{array}{r} -x - 11 \\ \hline \end{array}$$

check $x = -2$

$$0 = x^2 + 9x + 14$$

$$\sqrt{-2 + 11} - 5 = -2$$

$$0 = (x + 7)(x + 2)$$

$$\sqrt{9} - 5 = -2$$

check $x + 7 = 0$
 $x = -7$

check $x + 2 = 0$
 $x = -2$

$$3 - 5 = -2$$