Discussion for 2nd Exam

Tuesday, December 14, 2021 9:14 AM

Q3

$$\frac{x+1}{3x+6} = \frac{3}{x} + \frac{2x+6}{3(3x+6)}$$

Find x (solve)

$$\frac{3}{3}\,\frac{(x+1)}{(3x+6)}\,\frac{x}{x} = \frac{3}{x}\,\frac{3(3x+6)}{3(3x+6)} + \frac{2x+6}{3(3x+6)}\,\frac{x}{x}$$

$$\frac{3x(x+1)}{3x(3x+6)} = \frac{9(3x+6)}{3x(3x+6)} + \frac{x(2x+6)}{3x(3x+6)}$$ → LCD

$$3x(x+1) = 9(3x+6) + x(2x+6)$$

$$3x^2 + 3x = 27x + 54 + 2x^2 + 6x$$

$-2x^2$ $-2x^2$

$$x^2 + 3x = 33x + 54$$

$-33x$ $-33x$

$$x^2 - 30x = 54$$

-54 -54

$$x^2 - 30x - 54 = 0$$ ✓

$ab = -54$

$x^2 - 30x - 54 = 0$

$ab = -54$

$a + b = -30$

-27, 2

$(x + a)(x + b) = 0$

check

$3 \rightarrow x$

$x^2 - 10x - 24 = 0$

$ab = -24$

$a + b = -10$

-12, 2

$(x + a)(x + b) = 0$

$(x - 12)(x + 2) = 0$

$x - 12 = 0 \Rightarrow x = 12$

or $x + 2 = 0 \Rightarrow x = -2 \Rightarrow$ zero in denominator

check $x = 12$

solution

$$\frac{x+1}{3x+6} = \frac{3}{x} + \frac{2x+6}{x(3x+6)}$$

$$\frac{13}{36+6} \stackrel{?}{=} \frac{3}{12} + \frac{24+6}{12(36+6)}$$

$$\frac{13}{42} \stackrel{??}{=} \frac{\cancel{3}^{1}}{\cancel{12}_{4}} + \frac{5}{\cancel{30}\ \cancel{12}_{2}(42)}$$

$$\frac{13}{42} \overset{?}{=} \frac{1 \times 84}{4 \times 84} + \frac{5}{84} \times 4$$

$$\overset{?}{=} \frac{84 + 20}{(4)(84)}$$

$$\overset{?}{=} \frac{\cancel{104}\ \cancel{52}\ 13}{\cancel{(4)(84)}\ 1\ \cancel{42}}$$

$$\frac{13}{42} = \frac{13}{42}$$

29/1.2

$y = \sqrt{x+4}$

Find Domain + Rang

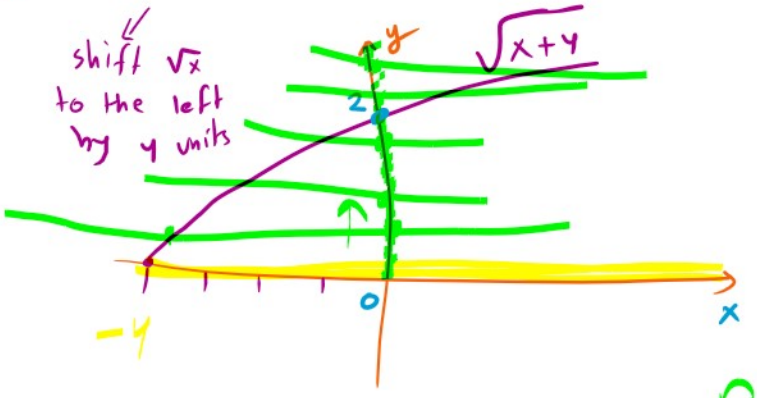
$x + 4 \geq 0$

$-4 \quad -4$

$x \geq -4$

$D = [-4, \infty)$

في x السعوح تعو في



$y(0) = \sqrt{0+4} = \sqrt{4} = 2$

$R = [0, \infty)$

قيم y الناتجة كن تعو في في x

الدرس الأول $ax^2 + bx + c = 0$ a ≠

2nd level $ax^2 + bx + c = 0$

a ✓
b ✓
c ✓

$D = b^2 - 4ac$

Exp Solve this equation

$$\frac{1}{x} = \frac{3}{1} - \frac{5}{x-1}$$

$$\frac{x-1}{x-1}\cdot\frac{1}{x} = \frac{x(x-1)}{x(x-1)}\cdot\frac{3}{1} - \frac{5}{x-1}\cdot\frac{x}{x}$$

$$\left[\frac{(x-1)}{x(x-1)} = \frac{3}{x(x-1)} - \frac{5x}{x(x-1)}\right] \times x(x-1)$$

LCD : least Common Denominator

$$x - 1 = 3x(x-1) - 5x$$

$$x - 1 = 3x^2 - 3x - 5x$$

$$x - 1 = 3x^2 - 8x$$

$$-x \qquad -x$$

$$-1 = 3x^2 - 9x$$

$$+1 \qquad +1$$

$$3x^2 - 9x + 1 = 0$$

$a = 3$

$$3x^2 - 9x + 1 = 0$$

$a = 3$

$b = -9$

$c = 1$

$\Delta = b^2 - 4ac$

$= (-9)^2 - 4(3)(1)$

$= 81 - 12$

$= 69 > 0 \Rightarrow$ ∃ two real roots "different"

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-9) \pm \sqrt{69}}{2(3)}$$

$$= \frac{9 \pm \sqrt{69}}{6}$$

$$x_1 = \frac{9 + \sqrt{69}}{6} \quad \checkmark \qquad x_2 = \frac{9 - \sqrt{69}}{6} \quad \checkmark$$

Check ---- x_1 ✓ x_2 ✓

Exp Find domain ① $y = \frac{\sqrt{x-1}}{x}$

$x \geq 1$

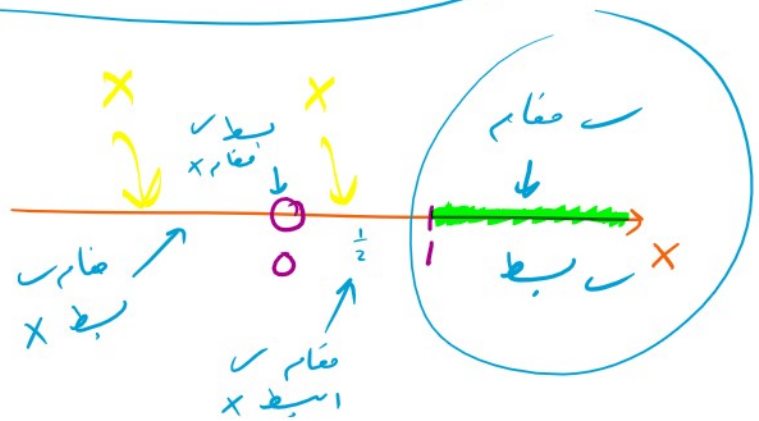
Exp Find domain (1) $y = \frac{}{\sqrt{x}}$

$x - 1 \geq 0$

$+1 \quad +1$

$x \geq 1$

$D = [1, \infty)$



(2) $y = \frac{x}{\sqrt{2x+6}}$

any #

$2x + 6 > 0$

$-6 \quad -6$

$\frac{2x}{2} > \frac{-6}{2}$

$x > -3$

$D = (-3, \infty)$

Q13 $x^2 - 4x = 4$

Q13 · 2.1

$x^2 - 4x = 4$

$-4 \quad -4$

$x^2 - 4x - 4 = 0$ → $a = 1$, $b = -4$, $c = -4$

$\Delta = b^2 - 4ac$

$= (-4)^2 - 4(1)(-4)$

$= 16 + 16$

$= 32 > 0 \Rightarrow$ two real roots

$\sqrt{ab} = \sqrt{a}\sqrt{b}$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-4) \pm \sqrt{32}}{2(1)} = \frac{4 \pm \sqrt{4 \cdot 8}}{2}$$

$$= \frac{4 \pm \sqrt{4}\sqrt{8}}{2} = \frac{4 \pm 2\sqrt{4 \cdot 2}}{2} = \frac{4 \pm 2\sqrt{4}\sqrt{2}}{2}$$

$$= \frac{4 \pm 2 \cdot 2\sqrt{2}}{2} = \frac{4 \pm 4\sqrt{2}}{2} = \frac{4}{2} \pm \frac{4\sqrt{2}}{2}$$

$= 2 \pm 2\sqrt{2}$

check $x^2 - 4x = 4$

$x_1 = 2 + 2\sqrt{2}$

$x_2 = 2 - 2\sqrt{2}$

check

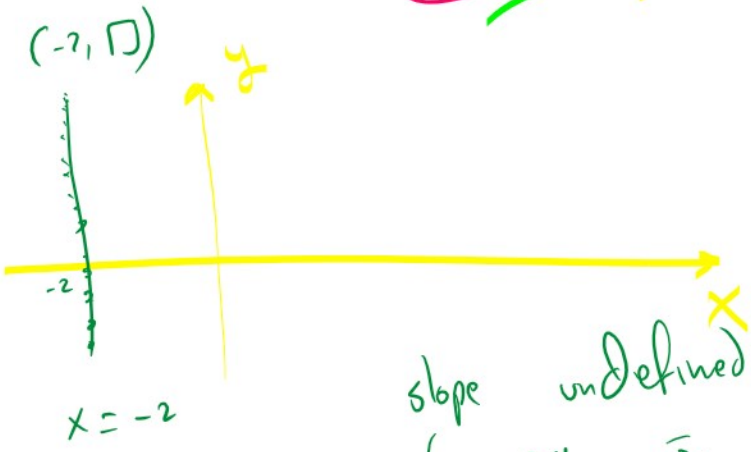
$x_1 = 2 + 2\sqrt{2}$

$(2+2\sqrt{2})^2 - 4(2+2\sqrt{2}) \stackrel{?}{=} 4$

$(2)^2 + 2(2)(2\sqrt{2}) + (2\sqrt{2})^2 - 8 - 8\sqrt{2} \stackrel{?}{=} 4$

$4 + 8\sqrt{2} + 4 \cdot 2 - 8 - 8\sqrt{2} \stackrel{?}{=} 4$

$4 = 4$



$x = -2$

slope undefined

$\frac{\Delta y}{\Delta x} = \frac{\varepsilon_1}{-2--2} = \frac{\varepsilon_1}{0}$