

Section 3.5 and 3.6 – Final Exam Prep

Answer the following four questions, show as many steps as you need to, write clearly and neatly.

1. Solve for the unknown value. State Domain Restrictions and Check Validity of the solution.

$$12 \cdot \frac{x}{4} - \frac{x+3}{6} = \frac{x-3}{3} \cdot 12$$

$$3x - 2(x+3) = 4(x-3)$$

$$3x - 2x - 6 = 4x - 12$$

$$x - 6 = 4x - 12$$

$$0 = 3x - 6$$

$$0 = 3(x - 2)$$

$$x = 2$$

NO RESTRICTIONS

2. Solve for the unknown value. State Domain Restrictions and Check Validity of the solution.

$$\frac{(x+2)3}{2x+8} = \frac{4(x+4)(2)}{x+2} + \frac{12 \cdot 2}{x^2+6x+8}$$

$$2(x+4) \quad x+2 \quad (x+2)(x+4)$$

$$x \neq -2, -4$$

$$3(x+2) = 4(2)(x+4) + 24$$

$$3x+6 = 8x+32+24$$

$$3x+6 = 8x+56$$

$$-5x = 50$$

$$x = -10$$

3. Solve for the unknown value. State Domain Restrictions and Check Validity of the solution.

$$x \neq -2, -1, 1$$

$$\frac{x}{x^2+x-2} = \frac{x}{x^2+3x+2} - \frac{x}{x^2-1}$$

$$(x+2)(x-1) \quad (x+2)(x+1) \quad (x+1)(x-1)$$

$$x(x+1) = x(x-1) - x(x+2)$$

$$x^2+x = x^2-x - x^2-2x$$

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

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

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

$$x = 0$$

$$x = -4$$

4. A boat can travel 20km against a current in the same time it can travel 60km with the current. If the current is 4km/hr, find the speed of the boat in still water.

Remember: $Speed = \frac{Distance}{Time}$

Let x be speed of boat

	D	S	t
up	20	$x-4$	$\frac{20}{x-4}$
down	60	$x+4$	$\frac{60}{x+4}$

$$t = \frac{d}{s}$$

$$\frac{20}{x-4} = \frac{60}{x+4}$$

$$20(x+4) = 60(x-4)$$

$$20x + 80 = 60x - 240$$

$$320 = 40x$$

$$\frac{320}{40} = x$$

$$8 = x$$

boat is going 8 km/hr