

answers

Ch 4B Practice Test

Simply the following as much as possible.

$$1. \frac{3x^3 - x^2}{x^2 - 2x - 15} \cdot \frac{x^2 - x - 20}{6x^4 - 2x^3}$$

$$\frac{\cancel{x^2}(3\cancel{x}-1)}{(\cancel{x}-5)(x+3)} \cdot \frac{(\cancel{x}-5)(x+4)}{2x^3(\cancel{3x}-1)}$$

$$\boxed{\frac{x+4}{2x(x+3)}}$$

$$3. \frac{x^2 - 36}{x^2 + 3x - 18} = \frac{(x-6)(\cancel{x+6})}{(\cancel{x+6})(x-3)}$$

$$\boxed{\frac{x-6}{x-3}}$$

$$2. \frac{3x^2}{x-1} \div \frac{9x^4}{x^2-1}$$

$$\frac{\cancel{3x^2}}{\cancel{x}-1} \cdot \frac{(\cancel{x}-1)(x+1)}{\cancel{9x^4} 3x^2}$$

$$\boxed{\frac{x+1}{3x^2}}$$

$$4. \frac{y^2 - 16}{y^2 - 10y + 25} \div \frac{3y - 12}{y^2 - 3y - 10}$$

$$\frac{(\cancel{y}-4)(y+4)}{(y-5)(\cancel{y}-5)} \cdot \frac{(\cancel{y}-5)(y+2)}{3(\cancel{y}-4)}$$

$$\boxed{\frac{(y+4)(y+2)}{3(y-5)}}$$

$$\left(\frac{x+3}{x+3}\right) 5. \frac{10}{x-2} + \frac{x}{x+3} \left(\frac{x-2}{x-2}\right)$$

$$\frac{10x+30+x^2-2x}{(x+3)(x-2)}$$

$$\boxed{\frac{x^2+8x+30}{(x+3)(x-2)}}$$

$$7. \frac{9x^3+54x^2}{x^2+5x-14} \cdot \frac{x^2+6x-7}{12x^2}$$

$$3 \frac{\cancel{9x^2}(x+6)}{(\cancel{x}+7)(x-2)} \cdot \frac{(\cancel{x}+7)(x-1)}{4\cancel{12x^2}}$$

$$\boxed{\frac{3(x+6)(x-1)}{4(x-2)}}$$

$$6. \frac{3-4x}{x^2+3x-10} - \frac{x+2}{x+5} \left(\frac{x-2}{x-2}\right)$$

$$\frac{3-4x-(x^2-4)}{(x+5)(x-2)}$$

$$\boxed{\frac{-x^2-4x+7}{(x+5)(x-2)}}$$

$$\left(\frac{x-2}{x-2}\right) 8. \frac{7}{3x^2-6x} - \frac{x^2}{x^2-4x+4} \left(\frac{3x}{3x}\right)$$

$$\boxed{\frac{-3x^3+7x-14}{3x(x-2)(x-2)}}$$

Solve for x.

$$\left(\frac{7(x-4)}{7(x-4)}\right) \cdot \frac{3}{x} + \frac{2(x-4)10}{7x(x-4)} = \frac{7x}{4(x-4)} \quad x \neq 0, 4 \quad \text{CD: } 7x(x-4)$$

$$21x - 84 + 2x - 8 = 70x$$

$$-92 = 47x$$

$$\boxed{x = -92/47}$$

$$\left(\frac{x}{x}\right) \frac{2}{x-1} - \left(\frac{x+2}{x}\right) \left(\frac{x-1}{x-1}\right) = \frac{x-1}{x-1} \quad x \neq 1, 0 \quad \text{CD: } x(x-1)$$

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

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

$$0 = (x-2)(x+1)$$

$$\boxed{x = 2, -1}$$

$$\left(\frac{x-4}{x-4}\right) \cdot \frac{3}{x} + \frac{2(x-4)10}{x(x-4)} = \frac{10}{x-4} \quad x \neq 4, 0 \quad \text{CD: } x(x-4)$$

$$3x - 12 + 2x = 10x$$

$$-12 = 5x$$

$$\boxed{-12/5 = x}$$

$$\left(\frac{x+1}{x+1}\right) \frac{2x}{x-1} + \frac{x-5}{x^2-1} = 1 \quad x \neq 1, -1 \quad \text{CD: } (x-1)(x+1)$$

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

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

$$(x+4)(x-1) = 0$$

$$\boxed{x = -4}, \quad \cancel{x = 1}$$

$$\left(\frac{x}{x}\right) \frac{7}{4x} - \frac{3(x)}{x^2} = \frac{1}{2x^2} \quad x \neq 0 \quad \text{CD: } 4x^2$$

$$7x - 12 = 2$$

$$7x = 14$$

$$\boxed{x = 2}$$

$$14. \frac{x}{x-3} - \frac{4(x-3)}{(x-3)(x-3)} = 3 \quad x \neq 3$$

$$x - 4x + 12 = 3$$

$$-3x = -9$$

$$\cancel{x = 3}$$

$$\boxed{\text{no solution}}$$

15. John can fix 4 computers in 5 hours and Jennifer can fix 3 computers in 2 hours, how long would it take for them to work together to fix 1 computer?

$$\left(\frac{2x}{2x}\right) \frac{4}{5} + \frac{3(5x)}{2(5x)} = \frac{1}{x} \left(\frac{10}{10}\right) \quad x \neq 0 \quad \text{CD: } 10x$$

$$8x + 15x = 10$$

$$23x = 10$$

$$x = 10/23$$

$$\boxed{x = 0.4 \text{ hrs}}$$

16. While practicing for the next big soccer game you have made 6 of the 11 shots you have taken. You will be able to go home once you reach at least 80%. How many more consecutive shots would you need to make before you leave?

$$\frac{6+x}{11+x} \geq \frac{80}{100}$$

$$100(6+x) \geq 80(11+x)$$

$$600 + 100x \geq 880 + 80x$$

$$20x \geq 280$$

$$\boxed{x = 14 \text{ shots}}$$

17. The time it takes for a canoe to go 3 miles upstream and back 3 miles downstream is 4 hours. The current in the lake is 1 mile per hour. Find the average speed (rate) of the canoe in still water.

down	3	$x+1$	$\frac{3}{x+1}$
up	3	$x-1$	$\frac{3}{x-1}$

4

$$\left(\frac{x-1}{x-1}\right) \frac{3}{x+1} + \frac{3(x-1)}{(x-1)(x-1)} = 4 \left(\frac{x^2-1}{x^2-1}\right) \quad x \neq -1, 1$$

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

$$0 = 4x^2 - 6x - 4$$

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

$$0 = 2(2x+1)(x-2)$$

$$\boxed{x = 2}$$

$$\cancel{x = -1/2}$$