

1. D

2. D is an excluded value/undefined

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

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

$$\frac{x^2 - 16 - x^2 - 5x + 4x + 20}{(x+5)(x-2)(x-4)}$$

$$\frac{-x+4}{(x+5)(x-2)(x-4)} = \frac{-(x-4)}{(x+5)(x-2)(x-4)} = \frac{-1}{(x+5)(x-2)} \longrightarrow A$$

4. x-int (b, 0) } V.A. x = -a, x = -b } No holes
 y-int (0, -b/a) or (0, a/b) } H.A. y = 0 } Di: (-∞, -a) ∪ (-a, b) ∪ (-b, ∞)
 R: (-∞, 0) ∪ (0, ∞)

5. Right now, numerator is ~~a-c~~ ~~b-c~~ ~~a+b~~ = -2c
 if ~~a+c~~ ~~b+c~~ ~~a+b~~ = 0
 So, should be $\frac{a+c}{a+b} - \frac{b+c}{a+b} - \frac{a-b}{a+b}$

6.
$$\frac{x}{4} + \frac{x}{4} + \frac{x}{6} = 500 \longrightarrow \frac{8x}{12} = 500 \longrightarrow 2x = 1500$$

$$\frac{3x + 3x + 2x}{12} = 500 \longrightarrow \frac{2x}{3} = 500 \longrightarrow x = 750 \quad A$$

7.
$$\frac{12}{18} + \frac{12}{x} = 1 \longrightarrow 12x + 216 = 18x$$

$$\frac{12x + 216}{18x} = 1 \longrightarrow 216 = 6x$$

$$36 = x \quad C$$

8.
$$t = \frac{d}{s} \quad \frac{24}{x} + \frac{24}{x-4} = 5$$

 to back
$$\frac{24x - 96 + 24x}{x(x-4)} = \frac{5}{1}$$

$$\frac{48x - 96}{x(x-4)} = \frac{5}{1}$$

$$48x - 96 = 5x(x-4)$$

$$48x - 96 = 5x^2 - 20x$$

$$5x^2 - 68x + 96 = 0$$

$$x = \frac{68 \pm \sqrt{4624 - 4(5)(96)}}{2(5)}$$

$$x = \frac{68 \pm \sqrt{2704}}{10}$$

$$x = \frac{68 \pm 52}{10} = 12 \text{ and } 1.6 \quad D$$

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

9. $t_{\text{varied}} = t_{\text{cycled}} + 10$

$$\frac{d_1}{s_1} + \frac{d_2}{s_2} + \frac{d_3}{s_3} = \frac{d_c}{s_c} + 10$$

$$\frac{1}{2x} + \frac{1}{x} + \frac{1}{3x} = \frac{3}{3x} + 10$$

run swim cycle

$$\frac{3+6+2}{6x} = \frac{3}{3x} + \frac{30x}{3x}$$

$$\frac{11}{6x} = \frac{30x+3}{3x}$$

$$33x = 180x^2 + 18x$$

$$15x = 180x^2$$

$$15 = 180x$$

$$\frac{1}{12} = x$$

$$\frac{1 \text{ mile}}{12 \text{ min}}$$

$$22 \text{ min}$$

$$\rightarrow \frac{3}{3x} + 10 = \frac{3}{3(\frac{1}{12})} + 10 = \frac{3}{\frac{1}{4}} + 10 = 12 + 10 = 22$$

B.

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

$$\frac{a+bx-2b}{(x+2)(x-2)} = \frac{5x+3}{(x+2)(x-2)}$$

$$(a+bx-2b)(\cancel{x+2})(\cancel{x-2}) = (5x+3)(\cancel{x+2})(\cancel{x-2})$$

$$a+bx-2b = 5x+3$$

$$bx+(a-2b) = 5x+3$$

$$b=5$$

$$\cancel{5x} + (a-2(5)) = \cancel{5x} + 3$$

$$a-10=3$$

$$a=13$$

$$a+b=18$$
$$13+5 \rightarrow$$

C

$$11. \frac{x^2 - 10x + 16}{2x^2 - 4x} \cdot \frac{10x^2}{x^2 - 64}$$

$$\frac{(x-8)(x-2)}{2x(x-2)} \cdot \frac{10x^2}{(x+8)(x-8)}$$

$$\frac{10x^2}{2x(x+8)} = \frac{5x}{x+8}$$

$$12. \frac{x^2 - 9}{x^2 + 3x - 18} \cdot \frac{x^2 + 13x + 42}{6x^2} \cdot \frac{3x}{5x + 35}$$

$$\frac{(x+3)(x-3)}{(x+6)(x-3)} \cdot \frac{(x+7)(x+6)(3x)}{(6x^2)(5)(x+7)}$$

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

$$13. V = lwh \rightarrow l = \frac{V}{wh} \text{ or } V \div (wh)$$

$$wh = \left(\frac{v+1}{2}\right)\left(\frac{6}{v}\right) = \frac{3(v+1)}{v}$$

$$\frac{2v^2 - 3v - 5}{8v - 20} \div \frac{3(v+1)}{v} = \frac{2v^2 - 3v - 5}{8v - 20} \cdot \frac{v}{3(v+1)}$$

	$2v$	-5	
v	$2v^2$	$-5v$	
	$2v$	-5	

$$\begin{matrix} -10 \\ +2 \\ -3 \end{matrix}$$

$$= \frac{(2v-5)(v+1)}{4(2v-5)} \cdot \frac{v}{3(v+1)} = \frac{v}{12}$$

$$14. \frac{c}{c+5} + \frac{7c-15}{c^2-25} + \frac{4}{c-5} = \left(\frac{c}{c+5}\right)\left(\frac{c-5}{c-5}\right) + \frac{7c-15}{(c+5)(c-5)} + \left(\frac{4}{c-5}\right)\left(\frac{c+5}{c+5}\right)$$

$$= \frac{c^2 - 5c + 7c - 15 + 4c + 20}{(c+5)(c-5)} = \frac{c^2 + 6c + 5}{(c+5)(c-5)} = \frac{(c+5)(c+1)}{(c+5)(c-5)}$$

$$= \frac{c+1}{c-5}$$

15. V.A. $x=2, x=-2$
 no holes
 h.A. $y=-1$

A