

## 4 Topic Assessment Form B

- The width,  $y$ , of a rectangle with a fixed area varies inversely with its length,  $x$ . The width is 4 inches when the length is 18 inches. Find the width when the length is 40 inches.  
 (A) 0.56 inches      (C) 10.08 inches  
 (B) 8.9 inches      (D) 1.8 inches
- What is the domain of the function  $f(x) = \frac{x^2 - x - 2}{x^4 - 81}$ ?  
 (A) All real numbers except 3  
 (B) All real numbers except  $-1$  and  $3$   
 (C) All real numbers except  $-3$  and  $3$   
 (D) All real numbers except  $-3$ ,  $1$ , and  $3$
- What are the horizontal and vertical asymptotes of the graph of  $y = \frac{x^2 - 3x - 4}{3 - x^2}$ ?  
 (A)  $y = -1$ ;  $x = \pm\sqrt{3}$   
 (B)  $y = 1$ ;  $x = \pm\sqrt{3}$   
 (C)  $y = -1$ ;  $x = 1$  and  $x = \sqrt{3}$   
 (D)  $y = -1$ ;  $x = 1$  and  $x = -\sqrt{3}$
- Simplify  $\frac{1}{x-y} - \frac{-6}{y-x}$ . What are the any restrictions on the domain of the expression?  
  
 The domain is  $\{x|x \neq \text{  }\}$ .

- Describe the transformations needed to translate the graph of  $y = \frac{1}{x}$  to the graph of  $y = 2 + \frac{1}{x-5}$ .  
 (A) to the left 5 and up 2  
 (B) to the left 2 and down 5  
 (C) to the right 2 and down 5  
 (D) to the right 5 and up 2
- Solve  $\frac{2x+4}{x^2+4x+3} = \frac{1}{x+1} + \frac{1}{x+3}$ .  
 (A) no solution  
 (B)  $x = 2$   
 (C)  $x = 1$  and  $2$   
 (D) all values of  $x$ ,  $x \neq -1$  and  $x \neq -3$
- Two robots can do a task in 5 min, working together. The first robot, working alone, can do the task in 15 min. How many minutes will it take the second robot, working alone, to do the task?  
 (A) 10      (B) 7.5      (C) 5      (D) 2
- What is the remainder when  $4x^4 - 10x^2 + 2x + 1$  is divided by  $4x - 1$ ?  
 (A)  $-\frac{1}{2}$       (B) 4      (C)  $\frac{57}{64}$       (D)  $-\frac{18}{37}$
- Solve  $\frac{2(1-x)}{3x} = 1 - \frac{3}{x}$ .  
 $x = \text{  }$

10. What is the sum  $\frac{1}{x-4} + \frac{-8}{x^2-16}$ ?

(A)  $\frac{-8}{x^2+x-20}$

(B)  $\frac{-7}{x+4}$

(C)  $\frac{1}{x^2+x+2}$

(D)  $\frac{1}{x+4}$

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11. Solve  $x = \frac{2x^2+x-7}{2x+8}$ .

(A) 1

(C) -1

(B)  $\frac{1}{2}$

(D) no solution

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12. What are the horizontal and vertical asymptotes of the graph of

$y = \frac{x^4+3}{x^4+2x^2-3}$ ?

(A)  $y = 1; x = \pm 1$

(B)  $y = 1; x = \pm 3$

(C)  $y = 0; x = 1$

(D)  $y = 0; x = -1$

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13. It takes 4 h for Faucet A to fill a tank, and it takes Faucet B 6 h. How many hours will it take the two faucets to fill the tank together?

(A) 1.4   (B) 2.4   (C) 2.0   (D) 5.0

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14. The graph of  $xy = 6$  is translated up 2 units and to the left 2 units. Select all the possible equations for the translated graph.

☐ A.  $y = 2 + \frac{6}{x+2}$

☐ B.  $\frac{y}{2} = \frac{x+5}{x+2}$

☐ C.  $y = \frac{2x+10}{x+2}$

☐ D.  $y = \frac{6x+10}{x-2}$

☐ E.  $y = 4 + \frac{4}{x-2}$

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15. If  $a = \frac{2}{x} + \frac{1}{y}$ , what is the value of  $\frac{1}{a}$ ?

(A)  $\frac{2y+x}{xy}$

(C)  $\frac{xy}{x+2y}$

(B)  $\frac{x+2y}{2xy}$

(D)  $x+2y$

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16. What are the horizontal and vertical asymptotes of the graph of

$y = \frac{-x+3}{x-8}$ ?

(A)  $y = -1; x = 8$

(B)  $y = -1; x = -8$

(C)  $y = 1; x = 8$

(D)  $y = 1; x = -8$

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17. Solve  $\frac{x^2+x-4}{x-2} = x - \frac{1}{x-2}$ .

(A) -2

(C) -1

(B) 1

(D) 3

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18. Select all the functions whose graphs have a horizontal asymptote at  $y = \frac{2}{3}$ .

☐ A.  $y = \frac{2}{3x-1}$

☐ B.  $y = \frac{2x^2+1}{3x^2-2}$

☐ C.  $y = \frac{2}{3} + \frac{1}{x}$

☐ D.  $y = \frac{2x-3}{3x^2+1}$

☐ E.  $y = 3 + \frac{3}{2x}$

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19. A rectangle has area  $x^3 - 15x - 4$  cm<sup>2</sup> and width  $x - 4$  cm. What is the length in centimeters?

(A)  $x^2 + 4x$

(B)  $x^2 - 4x + 2$

(C)  $x^2 + 4x + 1$

(D)  $x^2 + 1$

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