Daily Practice SAT

NAME Key

Rational Functions

14

Which of the following is a value of x for which the expression $\frac{-3}{(x^2+3x-10)}$ is undefined?

A) -3
B) -2
C) 0
D) 2

$(x+5)(x-2)=0$

$x=-5$, $x=2$

36

$x^2-10x+25+4x-20+4=0$

$x^2-6x+9=0$

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

$$h(x)=\frac{1}{(x-5)^2+4(x-5)+4}=0$$

For what value of x is the function h above undefined?

$\boxed{x=3}$

20

factor

$$f(x)=\frac{2x-4}{2x^2+2x-4}=\frac{2(x-2)}{2(x^2+1x-2)}=\frac{2\cdot(x-2)}{2\cdot(x+2)(x-1)}$$

A rational function is defined above. Which of the following is an equivalent form that displays values not included in the domain as constants or coefficients?

A) $f(x)=\frac{x-2}{x^2+x-2}$

B) $f(x)=\frac{2(x-2)}{2(x+2)(x-1)}$

C) $f(x)=\frac{1}{x+1}$

D) $f(x)=\frac{1}{2x^2}$

13

Which of the following expressions is equivalent to $\frac{x^2-2x-5}{x-3}$?

A) $x-5-\frac{20}{x-3}$

B) $x-5-\frac{10}{x-3}$

C) $x+1-\frac{8}{x-3}$

D) $x+1-\frac{2}{x-3}$

Ch. 5 Synthetic Division

$$\begin{array}{r|rrr} 3 & 1 & -2 & -5 \\ & & 3 & 3 \\ \hline & 1 & 1 & -2 \end{array}$$

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

12

Which of the following is equivalent to $\frac{4x^2+6x}{4x+2}$?

A) x

B) $x+4$

C) $x-\frac{2}{4x+2}$

D) $x+1-\frac{2}{4x+2}$

Polynomial Long Division

$$\begin{array}{r} x+1-\frac{2}{4x+2} \\ 4x+2\,\overline{)\,4x^2+6x+0} \\ -(4x^2+2x) \\ \hline 0 \quad 4x+0 \\ -(4x+2) \\ \hline 0 \quad -2 \end{array}$$

15

The expression $\frac{5x-2}{x+3}$ is equivalent to which of the following?

A) $\frac{5-2}{3}$

B) $5-\frac{2}{3}$

C) $5-\frac{2}{x+3}$

D) $5-\frac{17}{x+3}$

Synthetic Division

$$\begin{array}{r|rr} -3 & 5 & -2 \\ & & -15 \\ \hline & 5 & -17 \end{array}$$

$$5-\frac{17}{x+3}$$

13

If $x > 3$, which of the following is equivalent to $\frac{1}{\frac{(x+3)}{(x+3)}\cdot\frac{1}{(x+2)}+\frac{1}{(x+3)}\frac{(x+2)}{(x+2)}}$?

$$= \frac{1}{\frac{x+3+x+2}{(x+3)(x+2)}} = \frac{1}{\frac{2x+5}{x^2+5x+6}} \quad \text{flip}$$

$$= \frac{x^2+5x+6}{2x+5}$$

A) $\frac{2x+5}{x^2+5x+6}$

B) $\frac{x^2+5x+6}{2x+5}$

C) $2x+5$

D) x^2+5x+6

8

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

In the equation above, which of the following is a possible value of $x+1$?

A) $1-\sqrt{2}$

B) $\sqrt{2}$

C) 2

D) 4

Cross Multiply

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

$\sqrt{(x+1)^2} = \sqrt{2}$

$x+1 = \pm\sqrt{2}$

$(x+1) = \sqrt{2}$ | $(x+1) = -\sqrt{2}$

10

If $\frac{t+5}{t-5} = \frac{10}{1}$, what is the value of t?

A) $\frac{45}{11}$

B) 5

C) $\frac{11}{2}$

D) $\frac{55}{9}$

Cross Multiply

$t+5 = 10\cdot(t-5)$

$\cancel{t} + 5 = 10t - 50$

$-\cancel{t} \quad +50 \qquad -t \quad +50$

$\frac{55}{9} = \frac{9t}{9}$

5

If $\frac{5}{x} = \frac{15}{x+20}$, what is the value of $\frac{x}{5}$?

A) 10

B) 5

C) 2

D) $\frac{1}{2}$

$15x = 5(x+20)$

$15x = 5x + 100$

$-5x \quad -5x$

$10x = 100$

$x = 10$ so $\frac{x}{5} = \frac{10}{5} = 2$

6

If $\frac{a-b}{b=7} = \frac{3}{}$, which of the following must also be true?

if $b = 7$, then $a - b = 3$

so $a - 7 = 3$

and $a = 10$

A) $\frac{a}{b} = -\frac{4}{7}$

B) $\frac{a}{b} = \frac{10}{7}$

C) $\frac{a+b}{b} = \frac{10}{7}$

D) $\frac{a-2b}{b} = -\frac{11}{7}$

17

If $\frac{7}{9}x - \frac{4}{9}x = \frac{1 \cdot 3}{4 \cdot 3} + \frac{5}{12}$, what is the value of x ?

$$\frac{7x}{9} - \frac{4x}{9} = \frac{3}{12} + \frac{5}{12}$$

$$\frac{7x - 4x}{9} = \frac{3+5}{12}$$

$$\frac{3x}{9} = \frac{8}{12} = \frac{2 \cdot 4}{3 \cdot 4}$$

$$\frac{x}{3} = \frac{2}{3}$$

so, $\boxed{x = 2}$

19

Like Denominators

$$\frac{2x+6}{(x+2)^2} - \frac{2(x+2)}{(x+2)(x+2)} = 2x+6-2(x+2)$$

The expression above is equivalent to $\frac{a}{(x+2)^2}$, where a is a positive constant and $x \neq -2$.

What is the value of a ?

$2x + 6 - 2x - 4$

$6 - 4 = -2$

$\boxed{a = -2}$

13

Polynomial Long Division

The equation $\frac{24x^2+25x-47}{ax-2} = -8x-3-\frac{53}{ax-2}$ is true for all values of $x \neq \frac{2}{a}$, where a is a constant.

What is the value of a ?

A) -16

B) -3

C) 3

D) 16

$$\begin{array}{r} -8x - 3 \\ ax - 2 \overline{\big) 24x^2 + 25x - 47} \\ 24 \\ \hline \end{array}$$

So, $-8 \cdot (a) = 24$

$a = -3$