

Chapter 4 Test

Name KEY

Solve

1.  $\sqrt{3w+5} + 2 \leq 11$

RESTRICTION  $w < -5/3$

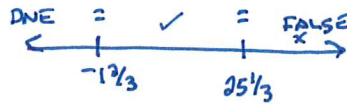
$$\sqrt{3w+5} \leq 9$$

$$3w+5 \leq 81$$

$$3w \leq 76$$

$$w \leq 25\frac{1}{3}$$

TEST FOR VIABLE SOLUTIONS



1. D:  $[-1\frac{1}{3}, 25\frac{1}{3}]$

2.  $\left[ \frac{3}{x+3} < \frac{x}{x-3} - \frac{34}{x^2-9} \right] (x-3)(x+3)$

RESTRICTIONS  $x \neq \{-3, 3\}$

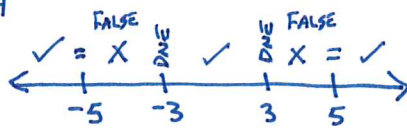
$$3(x-3) < x(x+3) - 34$$

$$3x-9 < x^2+3x-34$$

$$0 < x^2-25$$

$$0 < (x-5)(x+5)$$

TEST FOR VIABLE SOLUTIONS



2. D:  $(-\infty, -5) \cup (-3, 3) \cup (5, \infty)$

3.  $\left[ 2 + \frac{6}{x-4} > \frac{1}{3} \right] 3(x-4)$

RESTRICTION  $x \neq 4$

$$6(x-4) + 18 > x-4$$

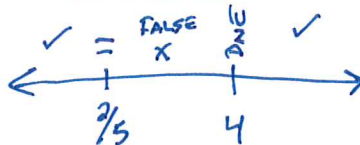
$$6x-24+18 > x-4$$

$$6x-6 > x-4$$

$$5x > 2$$

$$x > 2/5$$

TEST FOR VIABLE SOLUTIONS



3. D:  $(-\infty, 2/5) \cup (4, \infty)$

Decompose

4.  $\frac{5x+1}{x^2-x-12} \Rightarrow \frac{5x+1}{(x-4)(x+3)} = \frac{A}{x-4} + \frac{B}{x+3}$

$$\frac{5x+1}{(x-4)(x+3)} = \frac{A(x+3)}{(x-4)(x+3)} + \frac{B(x-4)}{(x-4)(x+3)}$$

$$\frac{5x+1}{(x-4)(x+3)} = \frac{Ax+3A+Bx-4B}{(x-4)(x+3)}$$

$$\begin{cases} A+B=5 \\ 3A-4B=1 \end{cases}$$

$$A=3$$

$$B=2$$

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

5.  $\frac{11x-7}{2x^2-3x-2} \Rightarrow \frac{11x-7}{(2x+1)(x-2)} = \frac{A}{2x+1} + \frac{B}{x-2}$

$$\frac{11x-7}{(2x+1)(x-2)} = \frac{A(x-2)}{(2x+1)(x-2)} + \frac{B(2x+1)}{(2x+1)(x-2)}$$

$$\frac{11x-7}{(2x+1)(x-2)} = \frac{Ax-2A+2Bx+B}{(2x+1)(x-2)}$$

$$\begin{cases} A+2B=11 \\ -2A+B=-7 \end{cases}$$

$$A=5$$

$$B=3$$

5.  $\frac{5}{2x+1} + \frac{3}{x-2}$



8.  $f(x) = 2x^7 - x^6 + 61x^5 - 8x^4 - 1678x^3 + 1829x^2 - 6615x + 8820$

a) Determine the number of possible real and imaginary roots. (List out the scenarios)

8a.

Real	Imaginary
7	0
5	2
3	4
1	6

b) Determine the number of possible positive and negative real roots. (List out the scenarios fitting the real roots to each outcome listed above.)

$$f(x) = 2x^7 - x^6 + 61x^5 - 8x^4 - 1678x^3 + 1829x^2 - 6615x + 8820$$

$\uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow$   
 -6615x + 8820      6 pos

$$f(-x) = -2x^7 - x^6 - 61x^5 - 8x^4 + 1678x^3 + 1829x^2 + 6615x + 8820$$

$\uparrow$   
 +6615x + 8820      1 NEG

Positive	Negative
7 REAL	
6	1
5 REAL	
4	1
3 REAL	
2	1
1 REAL	
0	1

c) Find the actual roots and classify each

8c.

Roots	Type
.0156 + 6.8461i	IMAGINARY
.0156 - 6.8461i	IMAGINARY
-4.6924...	<u>IRRATIONAL</u>
4.1087...	<u>IRRATIONAL</u>
-.1152 + 1.9472i	IMAGINARY
-.1152 - 1.9472i	IMAGINARY
1.2827	<u>IRRATIONAL</u>