

Transitions to College Math  
Test Review - R.4-R.6

Name: Key  
Date: \_\_\_\_\_ Period: \_\_\_\_\_

1. Simplify.

$$3x - \{5 - 3[x - x(3-x)]\}$$

$$3x - \{5 - 3[x - 3x + x^2]\}$$

$$3x - \{5 - 3[-2x + x^2]\}$$

$$3x - \{5 + 6x - 3x^2\}$$

$$3x - 5 - 6x + 3x^2$$

$$3x^2 - 3x - 5$$

2. Simplify.

$$\frac{1}{n+9} \div \frac{n-6}{3n-18}$$

$$\frac{1}{n+9} \div \frac{n-6}{3(n-6)}$$

$$\frac{1}{n+9} \cdot \frac{3}{1}$$

$$\frac{3}{n+9}$$

3. Simplify and find the domain.

$$\frac{x^2 + x - 6}{x^2 + 8x + 15}$$

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

$$\frac{x-2}{x+5}$$

D:  $\mathbb{R}$  except  
 $x = -5, -3$

4. Simplify

$$\frac{a^2}{a-b} + \frac{b^2}{b-a}$$

$$\frac{a^2}{a-b} - \frac{b^2}{a-b}$$

$$\frac{a^2 - b^2}{a-b}$$

$$\frac{(a+b)(a-b)}{a-b}$$

$$a+b$$

5. Simplify

$$\frac{x}{x^2+9x+20} - \frac{4}{x^2+7x+12}$$

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

$$\frac{x^2+3x}{(x+3)(x+4)(x+5)} - \frac{4x+20}{(x+3)(x+4)(x+5)}$$

$$\frac{x^2-x-20}{(x+3)(x+4)(x+5)}$$

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

6. Simplify

$$9 - \frac{1}{k^2} \cdot \frac{k^2}{k^2}$$

$$\frac{9k^2-1}{3k-1}$$

$$\frac{(3k+1)(3k-1)}{3k-1}$$

$$3k+1$$

For each of the following, factor completely.

7.  $x^2-16$   
 $(x+4)(x-4)$

8.  $25x^2-1$   
 $(5x+1)(5x-1)$

9.  $64x^2-1$   
 $(8x+1)(8x-1)$

10.  $36x^2-4$   
 $(6x+2)(6x-2)$

11.  $x^2-2x+1$   
 $(x-1)^2$

12.  $x^2+6x+9$   
 $(x+3)^2$

13.  $x^2+8x+16$   
 $(x+4)^2$

14.  $x^2-20x+100$   
 $(x-10)^2$

15.  $x^3-1$   
 $(x-1)(x^2+x+1)$

16.  $x^3-8$   
 $(x-2)(x^2+2x+4)$

17.  $x^3-27$   
 $(x-3)(x^2+3x+9)$

18.  $x^3-64$   
 $(x-4)(x^2+4x+16)$

19.  $x^3+1$   
 $(x+1)(x^2-x+1)$

20.  $x^3+8$   
 $(x+2)(x^2-2x+4)$

21.  $x^3+27$   
 $(x+3)(x^2-3x+9)$

22.  $8x^3+1$   
 $(2x+1)(4x^2-2x+1)$

23.  $(2x^2+6x+5)(5x+15)$   
 $2x(x+3)+5(x+3)$   
 $(2x+5)(x+3)$

24.  $(8ax-6x)(12a+9)$   
 $2x(4a-3)-3(4a-3)$   
 $(2x-3)(4a-3)$

25.  $(10y^3+10y^2)(3y+3)$   
 $10y^2(y+1)+3(y+1)$   
 $(y+1)(10y^2+3)$

26.  $5x^2y-7x^2-7+5y$   
 $x^2(5y-7)+1(5y-7)$   
 $(x^2+1)(5y-7)$

27.  $(3x^2+xy^2)(3xy-y^3)$   
 $x(3x-y^2)-3y(3x-y^2)$   
 $(x-3y)(3x-y^2)$