

Name: \_\_\_\_\_  
MAT 296

Quiz 3: Partial Fractions  
Spring 2015

For each of the following problems, indicate the correct partial fraction decomposition:

**Problem 1:**

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

- (i)  $\frac{A}{x} + \frac{Bx+C}{x^2} + \frac{D}{x+3}$
- (ii)  $\frac{A}{x^2} + \frac{B}{x+3}$
- (iii)  $\frac{Ax+B}{x^2} + \frac{C}{x+3}$
- (iv)  $\frac{A}{x} + \frac{B}{x} + \frac{C}{x+3}$
- (v) None of the above

**Problem 2:**

$$\frac{x^2+x+17}{x^2(3x+5)^2}$$

- (i)  $\frac{A}{x^2} + \frac{B}{(3x+5)^2}$
- (ii)  $\frac{A}{x} + \frac{B}{x^2} + \frac{C}{3x+5} + \frac{D}{(3x+5)^2}$
- (iii)  $\frac{A}{x} + \frac{Bx+C}{x^2} + \frac{D}{3x+5} + \frac{Ex+F}{(3x+5)^2}$
- (iv)  $\frac{A}{x} + \frac{Bx+C}{x^2} + \frac{Dx+E}{3x+5} + \frac{Fx+G}{(3x+5)^2}$
- (v) None of the above

**Problem 3:**

$$\frac{2x+13}{x^2(2x^2+5)^2}$$

- (i)  $\frac{A}{x^2} + \frac{B}{2x^2+5} + \frac{C}{(2x^2+5)^2}$
- (ii)  $\frac{A}{x} + \frac{B}{x^2} + \frac{C}{2x^2+5} + \frac{D}{(2x^2+5)^2}$
- (iii)  $\frac{A}{x} + \frac{B}{x^2} + \frac{Cx+D}{2x^2+5} + \frac{Ex+F}{(2x^2+5)^2}$
- (iv)  $\frac{A}{x} + \frac{Bx+C}{x^2} + \frac{Dx+E}{2x^2+5} + \frac{Fx+G}{(2x^2+5)^2}$
- (v) None of the above

**Problem 4:** A student is trying to solve  $\int \frac{x^6 - 2x^5 + 6x + 7}{x^2(x-5)} dx$ . As their first step, they break the fraction into

$$\frac{A}{x} + \frac{B}{x^2} + \frac{C}{x-5}$$

Is this a correct first step? If not, what should they have done first?

**Problem 5:** Integrate the following:

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