

Who is planning on doing some integration? key

AP Calculus BC: 10.7 Integration by Parts Tabular

1.  $\int 2x^3 \cos(x) dx$

sign	u	dv
+	$2x^3$	$\cos(x)$
-	$6x^2$	$\sin(x)$
+	$12x$	$-\cos(x)$
-	$12$	$-\sin(x)$
+	$0$	$\cos(x)$

$$2x^3 \sin(x) + 6x^2 \cos(x) - 12x \sin(x) - 12 \cos(x)$$

2.  $\int 3x^2 e^{2x} dx$

sign	u	dv
+	$3x^2$	$e^{2x}$
-	$6x$	$e^{2x}/2$
+	$6$	$e^{2x}/4$
-	$0$	$e^{2x}/8$

$$\frac{3x^2 e^{2x}}{2} - \frac{6x e^{2x}}{4} + \frac{6e^{2x}}{8}$$

$$\frac{3x^2 e^{2x}}{2} - \frac{3x e^{2x}}{2} + \frac{3e^{2x}}{4}$$

3.  $\int -x^4 \sin(2x) dx$

s  
-c  
-s  
c

sign	u	dv
+	$-x^4$	$\sin(2x)$
-	$-4x^3$	$-\cos(2x)/2$
+	$-12x^2$	$-\sin(2x)/4$
-	$-24x$	$\cos(2x)/8$
+	$-24$	$\sin(2x)/16$
-	$0$	$-\cos(2x)/32$

$$\frac{x^4 \cos(2x)}{2} - x^3 \sin(2x) - \frac{3}{2} x^2 \cos(2x) + \frac{3}{2} x \sin(2x) + \frac{3}{4} \cos(2x)$$

4.  $\int 5x^2 e^{-x} dx$

sign	u	dv
+	$5x^2$	$e^{-x}$
-	$10x$	$-e^{-x}$
+	$10$	$e^{-x}$
-	$0$	$-e^{-x}$

$$-5x^2 e^{-x} - 10x e^{-x} - 10e^{-x}$$

5. Find the area under the curve of the function  $f(x) = 4x^2 e^x$  for the interval  $[-1, 0]$ .

sign	u	dv
+	$4x^2$	$e^{-x}$
-	$8x$	$-e^{-x}$
+	$8$	$e^{-x}$
-	$0$	$-e^{-x}$

$$[-4x^2 e^{-x} - 8x e^{-x} - 8e^{-x}]^0_{-1}$$

$$[-8e^0] - [-4e^1 + 8e^1 - 8e^1] = -8 + 4e$$