

1. Silakan Pelajari dan persiapkan materi yang ada sesuai RPS yang ada pada FILE yang terlampir.
2. Silakan diskusikan dan palajari materi yang ada pada FILE yang terlampir, kalau ada yang kurang jelas dan tidak mengerti, silakanditanyakan pada forum ini.
3. Berikan jawaban atau komentar , sesuai materi ini sebelum batas waktu yang sudah ditentukan.

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Tugas: Matematika Terapan Tugas 1

Latihan Soal 1.1, Temukan turunan dari :

3.  $y = x^5 \Rightarrow z = x^2 + 1$ , carilah  $\frac{dy}{dx}$ !

$$y' = (x^2 + 1)^5, \quad \frac{dy}{dx} = \frac{dy}{dz} \times \frac{dz}{dx}$$

$$y' = 5z^4 \cdot 2x$$

$$y' = 10x \cdot z^4$$

$$y' = 10x (z^2 + 1^4)$$

15.  $y = \sqrt{x} + 1\sqrt{x}$

$$y' = x^{\frac{1}{2}} + 1x^{\frac{1}{2}}$$

Latihan Soal 1.2, tentukanlah turunan dari :

1.  $y = \sin x \cos x$

$$y' = x \cos x \cdot x \sin x$$

7.  $y = \frac{3x^2 + 2x - 9}{x^3 + 1} \Rightarrow U = 3x^2 + 2x - 9, \quad V = x^3 + 1$   
 $U' = 2x^2 \quad V' = 3x$

$$y' = \frac{U'V - V'U}{V^2} = \frac{2x^2(x^3 + 1) - 3x(3x^2 + 2x - 9)}{(x^3 + 1)^2}$$

$$= \frac{2x^5 + 3x^2 - 9x^2 + 6x^2 - 27x}{3x^2 + 1 + x^5}$$

$$= \frac{-3x^2 + 27x + 2x^5}{x^5 + 3x^2 + 1}$$

8.  $y = 1(x^2 + 1)$

$$y' = 1x^2 + 1$$

Lakhan soal 1-3

1.  $y = \sin(3x+2)$

$$y' = \int \sin(3x+2)$$

$$y' = \int \cos 3x + \cos 2 + c.$$

3.  $y = e^{-3t}$

$$y' = \frac{e}{3+1} t^{(3+1)} = e^1 + c.$$

5.  $y = 3r^2 - \sqrt{t}$

$$y' = 3r^2 - t^{\frac{1}{2}}$$

8.  $y = 4 \cos(9x+2)$

$$y' = \int 36 \cos x + 8 \cos$$

$$y' = \cos x + 11x + c$$

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LATIHAN 1.1:

1.  $y = e^{-7x}$

$$y' = -7e^{-7x}$$

2.  $y = \tan(3x-2)$

$$y' = 3\sec^2(3x-2)$$

3.  $y = x^5$

$$y' = 5x^4$$

4.  $y = \sin(wx + \theta)$

$$y' = w\cos(wx + \theta)$$

5.  $y = \frac{1}{t^5}$

$$y' =$$

6.  $y = \cos(4-t)$

$$y' = -\sin(4-t)$$

7.  $y = \pi$

$$y' = 0$$

8.  $y = \cos^{-1}(4t-3)$

$$y' = \frac{4}{\sqrt{1-(4t-3)^2}}$$

9.  $y = \sin^{-1}(-2t-3)$

$$y' = \frac{-2}{\sqrt{1-(-2t-3)^2}}$$

$$t^2 - 5t + 4 = 0$$

$$(t-1)(t-4) = 0$$

$$t = 1 \text{ atau } t = 4.$$

LATIHAN 1.2 :

1.  $y = \sin x \cdot \cos x$

$$u = \sin x \rightarrow u' = \cos x$$

$$v = \cos x \rightarrow v' = -\sin x$$

$$y' = uv' + vu'$$

$$= \sin x (-\sin x) + \cos x \cdot \cos x$$

$$= \cos^2 x - \sin^2 x$$

$$= \cos 2x$$

2.  $y = \sqrt{x} \cdot e^x$

3.  $y = e^t \sin t \cdot \cos t$

4.  $y = e^t \sin t \cdot \cos t$

5.  $y = \frac{\cos x}{\sin x}$

$$u = \cos x \rightarrow u' = -\sin x$$

$$v = \sin x \rightarrow v' = \cos x$$

$$y' = \frac{u'v - uv'}{v^2}$$

$$= \frac{-\sin x \cdot \sin x - \cos x \cdot \cos x}{(\sin x)^2}$$

$$= \frac{-\sin^2 x - \cos^2 x}{\sin^2 x}$$

$$10. y = \frac{1}{\sin(5x+3)}$$

$$y' =$$

$$11. y = 3 \sin(5t) + 2e^{4t}$$

$$y' = 3 \cos(5t) + 8e^{4t}$$

$$12. y = 2e^{3t} + 17 - 4 \sin(2t)$$

$$y' = 6e^{3t} - 4 \cos(2t)$$

$$13. y = \frac{1}{t^4} + \frac{\cos 5t}{2}$$

$$14. y = \frac{2w^3}{3} + \frac{e^{4w}}{2}$$

$$15. y' = \sqrt{x} + \ln(\sqrt{x})$$

$$y' =$$

$$16. y = 3 \sin^{-1}(2t) - 5 \cos^{-1}(3t)$$

$$y' =$$

$$17. y = \frac{1}{2} \tan^{-1}(t+2) + 4 \cos^{-1}(2t-1)$$

$$y' =$$

$$18. y = \frac{t^3}{3} - \frac{5t^2}{2} + 4t + 1$$

$$y = \frac{1}{3}t - \frac{1}{2}5t^2 + 4t + 1$$

$$a. \frac{dy}{dt} = t^2 - 5t + 4$$

b. jika Turunan pertama (0) maka nilai t =

$$6. y = \frac{e^{2t}}{t^3+1}$$

$$7. y = \frac{3x^2 + 2x - 9}{x^3 + 1}$$

$$u = 3x^2 + 2x - 9 \rightarrow u' = 6x + 2.$$

$$v = x^3 + 1 \rightarrow v' = 3x^2$$

$$y' = \frac{u'v - uv'}{v^2}$$

$$= \frac{(6x+2)(x^3+1) - (3x^2+2x-9)(3x^2)}{(x^3+1)^2}$$

$$= \frac{(6x^4 + 6x + 2x^3 + 2) - (9x^4 + 6x^3 - 24x^2)}{(x^3+1)^2}$$

$$= \frac{-3x^4 - 4x^3 + 24x^2 + 6x + 2}{(x^3+1)^2}$$

$$8. y = \ln(x^2+1)$$

$$9. y = \sin^3(3t+2)$$

$$u = 3t+2 \rightarrow u' = 3$$

$$y' = n \cdot u \sin^{n-1} \cos u$$

$$y' = 3(3) \sin^{3-1} \cos(3t+2)$$

$$= 9 \sin^2 \cos(3t+2)$$

$$10. y = \frac{1}{t+1} = (t+1)^{-1}$$

$$y' = -1(t+1)^{-2} \cdot 1$$

$$= \frac{-1}{(t+1)^2}$$

## LATIHAN 1.3

1.  $y = \sin(3x+2)$

$$y = \int \sin(3x+2) \cdot dx$$

$$y = \frac{-\cos(3x+2)}{3} + C$$

2.  $y = 5 \cdot g$

$$y = \int 5 \cdot g$$

$$y = 5 \cdot g x + C$$

3.  $y = e^{-3t}$

$$y = \int e^{-3t} \cdot dt$$

$$y = -\frac{1}{3} e^{-3t} + C$$

4.  $y = \frac{1}{x^5} = x^{-5}$

$$y = \int x^{-5} \cdot dx$$

$$y = \ln x^5 + C$$

5.  $y = 3t^2 - \sqrt{t} = 3t^2 - t^{1/2}$

$$y = \int 3t^2 - t^{1/2} \cdot dt$$

$$y = t^3 + 2t^{-1/2} + C$$

6.  $y = \frac{\sin x + \cos x}{2}$

7.  $y = 7 \operatorname{cosec}\left(\frac{\pi}{2}\right)$

$$y = 4 \cos(gx+2)$$

8.  $y = \int 4 \cos(gx+2) \cdot dx$

$$y = \frac{4 \sin(gx+2)}{g} + C$$



$$9 \int \cos^2 t \cdot dt.$$

$$\int \frac{1 + \cos 2t}{2} \cdot dt$$

$$y = \frac{1}{2}t + \frac{1}{4}\sin 2t + C.$$

$$10 \cdot \int \sin^2 t \cdot dt.$$

$$\int \frac{1 - \cos 2t}{2} \cdot dt$$

$$y = \frac{1}{2}t - \frac{1}{2}\sin 2t + C$$

$$11 \int x \cdot e^{2x} \cdot dx$$

$$u = x \rightarrow du = dx.$$

$$du = e^{2x} \cdot dx \rightarrow v = \int e^{2x} dx = \frac{1}{2} e^{2x}$$

$$y = \int x e^{2x} \cdot dx$$

$$= x \cdot \frac{1}{2} e^{2x} - \int \frac{1}{2} \cdot e^{2x} \cdot dx$$

$$= \frac{1}{2} x \cdot e^{2x} - \frac{1}{2} \int e^{2x} \cdot dx$$

$$= \frac{1}{2} x \cdot e^{2x} - \frac{1}{4} e^{2x} + C$$

$$12 \cdot \int e^t \cdot \sin t \cdot dt.$$

$$13. \int (3x+1)^5 \cdot dx.$$

$$u = 3x+1 \rightarrow \frac{du}{dx} = 3 \text{ atau } dx \frac{du}{3}$$

$$y = \int (3x+1)^5 \cdot dx$$

$$u = 3x+1 \rightarrow \frac{du}{dx} = 3 \text{ atau } dx \frac{du}{3}$$

$$y = \int (3x+1)^5 \cdot dx = \int (u)^5 \frac{du}{3}$$

$$= \int \frac{1}{3} (u)^5 \cdot du$$

$$= \frac{1}{3} \times \frac{1}{6} (3x+1)^6 + C$$

$$14 \int_1^4 \sin t \cdot \cos^2 t \cdot dt.$$

$$15 \int \frac{4}{(5x-7)} dx$$

Latihan Soal I.1

Temukan turunan dari

1.  $y = e^{-7x} \rightarrow y' = -7e^{-7x}$
2.  $y = \tan(3x - 2) \rightarrow y' = 3 \cdot \sec^2(3x - 2)$
3.  $y = x^5 \rightarrow y' = 5x^4$
4.  $y = \sin(\omega x + \theta) \rightarrow y' = \omega \cos(\omega x + \theta)$
5.  $y = \frac{1}{t^5} \rightarrow y = t^{-5} \rightarrow y' = -5t^{-6} = -\frac{5}{t^6}$
6.  $y = \cos(4 - t) \rightarrow y' = -(-1) \cdot \sin(4 - t) \rightarrow y' = \sin(4 - t)$
7.  $y = \pi \rightarrow y' = 0$
8.  $y = \cos^{-1}(4t - 3) \rightarrow y' = \frac{-4}{\sqrt{1-(4t-3)^2}}$
9.  $y = \sin^{-1}(-2t - 3) \rightarrow y' = \frac{-2}{\sqrt{1-(-2t-3)^2}}$
10.  $y = \frac{1}{\sin(5x+3)}$ , misal  $u = 1, u' = 0, v = \sin(5x + 3), v' = 5 \cdot \cos(5x + 3)$   
 $y' = \frac{u}{v} = \frac{u'v - v'u}{v^2} = \frac{0 \cdot \sin(5x + 3) - 5 \cdot \cos(5x + 3) \cdot 1}{\sin^2(5x + 3)} \rightarrow y' = \frac{-5 \cdot \cos(5x + 3)}{\sin^2(5x + 3)} = -5 \cdot \frac{1}{\sin(5x + 3)} \cdot \frac{\cos(5x + 3)}{\sin(5x + 3)}$   
 $y' = -5 \cdot \operatorname{cosec}(5x + 3) \cdot \cot(5x + 3)$   
 atau  
 $y = \frac{1}{\sin(5x + 3)} = \operatorname{cosec}(5x + 3) \rightarrow y' = -5 \cdot \operatorname{cosec}(5x + 3) \cdot \cot(5x + 3)$
11.  $y = 3 \sin(5t) + 2e^{4t} \rightarrow y' = \frac{d(3 \sin(5t))}{dt} + \frac{d(2e^{4t})}{dt} = 5 \cdot 3 \cos(5t) + 2 \cdot 4 e^{4t} \rightarrow y' = 15 \cos(5t) + 8e^{4t}$
12.  $y = 2e^{3t} + 17 - 4 \sin(2t) \rightarrow y' = \frac{d(2e^{3t})}{dt} + \frac{d(17)}{dt} - \frac{d(4 \sin(2t))}{dt} = 2 \cdot 3e^{3t} + 0 - 4 \cdot 2 \cos(2t) = 6e^{3t} - 8 \cos(2t)$
13.  $y = \frac{1}{t^3} + \frac{\cos 5t}{2} = t^{-3} + \frac{1}{2} \cos 5t \rightarrow y' = \frac{d(t^{-3})}{dt} + \frac{1}{2} \frac{d(\cos 5t)}{dt} = -3t^{-4} + \frac{1}{2}(-5 \sin 5t) \rightarrow y' = -3t^{-4} - \frac{5}{2} \sin 5t$
14.  $y = \frac{2w^3}{3} + \frac{e^{4w}}{2} \rightarrow y' = \frac{2}{3} \frac{d(w^3)}{dw} + \frac{1}{2} \frac{d(e^{4w})}{dw} = \frac{2}{3} 3w^2 + \frac{1}{2} 4e^{4w} \rightarrow y' = 2w^2 + 2e^{4w}$
15.  $y = \sqrt{x} + \ln(\sqrt{x}) = x^{\frac{1}{2}} + \ln(x^{\frac{1}{2}}) \rightarrow y' = \frac{d(x^{\frac{1}{2}})}{dx} + \frac{d(\ln(x^{\frac{1}{2}}))}{dx} = \frac{1}{2}x^{-1/2} + x^{-1/2} \rightarrow y' = \frac{3}{2\sqrt{x}}$
16.  $y = 3 \sin^{-1}(2t) - 5 \cos^{-1}(3t) \rightarrow y' = 3 \frac{d(\sin^{-1}(2t))}{dt} - 5 \frac{d(\cos^{-1}(3t))}{dt} = 3 \frac{2}{\sqrt{1-2t^2}} - 5 \frac{-3}{\sqrt{1-3t^2}} = \frac{6}{\sqrt{1-2t^2}} + \frac{15}{\sqrt{1-3t^2}}$
17.  $y = \frac{1}{2} \tan^{-1}(t + 2) + 4 \cos^{-1}(2t - 1) \rightarrow y' = \frac{1}{2} \frac{d(\tan^{-1}(t+2))}{dt} + 4 \frac{d(\cos^{-1}(2t-1))}{dt}$   
 $y' = \frac{1}{2} \cdot \frac{1}{1 + (t + 2)^2} + 4 \frac{-2}{\sqrt{1 - (2t - 1)^2}} \rightarrow y' = \frac{1}{2 + 2 \cdot (t + 2)^2} - \frac{8}{\sqrt{1 - (2t - 1)^2}}$
18. sebuah fungsi :  $y(t) = \frac{t^3}{3} - \frac{5t^2}{2} + 4t + 1$ 
  - a. Tentukan  $\frac{dy}{dt} \rightarrow \frac{dy}{dt} = \frac{3t^2}{3} - \frac{5 \cdot 2t}{2} + 4 = t^2 - 5t + 4$
  - b. Jika turunan pertama fungsi tersebut nol, berapa nilai t?  
 $t^2 - 5t + 4 = 0, a = 1, b = -5, c = 4 \rightarrow t = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 1 \cdot 4}}{2 \cdot 1}$   
 $t = \frac{5 \pm \sqrt{25 - 16}}{2} = \frac{5 \pm \sqrt{9}}{2} = \frac{5 \pm 3}{2} \rightarrow t_1 = \frac{5 + 3}{2} = 4, t_2 = \frac{5 - 3}{2} = 1$

Latihan Soal I.2

Carilah Turunan dari fungsi berikut ini :

- $y = \sin x \cos x$ , misal  $u = \sin x, u' = \cos x, v = \cos x, v' = -\sin x$   
 $y' = u'v + uv' \rightarrow y' = \cos x \cdot \cos x + \sin x \cdot (-\sin x) = \cos^2 x - \sin^2 x = \cos 2x$
- $y = \sqrt{x}e^x$ , misal  $u = x^{1/2}, u' = \frac{1}{2}x^{-1/2} = \frac{1}{2\sqrt{x}}, v = e^x, v' = e^x$   
 $y' = u'v + uv' \rightarrow y' = \frac{1}{2\sqrt{x}}e^x + \sqrt{x}e^x$
- $y = e^t \sin t \cos t$ , misal  $u = e^t, u' = e^t, v = \sin t, v' = \cos t, w = \cos t, w' = -\sin t$   
 $y' = u'vw + uv'w + uvw' = e^t \sin t \cos t + e^t \cos t \cos t + e^t \sin t(-\sin t) = e^t (\sin t \cos t + (\cos^2 t - \sin^2 t))$   
 $y' = e^t (\sin t \cos t + \cos 2t)$
- $y = e^t \sin t \cos t$ , misal  $u = e^t, u' = e^t, v = \sin t, v' = \cos t, w = \cos t, w' = -\sin t$   
 $y' = u'vw + uv'w + uvw' = e^t \sin t \cos t + e^t \cos t \cos t + e^t \sin t(-\sin t) = e^t (\sin t \cos t + (\cos^2 t - \sin^2 t))$   
 $y' = e^t (\sin t \cos t + \cos 2t)$
- $y = \frac{\cos x}{\sin x}$ , misal  $u = \cos x, u' = -\sin x, v = \sin x, v' = \cos x$   
 $y' = \frac{u'v - v'u}{v^2} = \frac{-\sin x \cdot \sin x - \cos x \cdot \cos x}{\sin^2 x} = -\frac{(\sin^2 x + \cos^2 x)}{\sin^2 x} = -\frac{1}{\sin^2 x} = -\operatorname{cosec} x$
- $y = \frac{e^{2t}}{t^3+1}$ , misal  $u = e^{2t}, u' = 2e^{2t}, v = t^3 + 1, v' = 3t^2$   
 $y' = \frac{u'v - v'u}{v^2} = \frac{2e^{2t} \cdot (t^3 + 1) - 3t^2 \cdot e^{2t}}{(t^3 + 1)^2}$
- $y = \frac{3x^2+2x-9}{x^3+1}$ , misal  $u = 3x^2 + 2x - 9, u' = 6x + 2, v = x^3 + 1, v' = 3x^2$   
 $y' = \frac{u'v - v'u}{v^2} = \frac{(6x + 2) \cdot (x^3 + 1) - 3x^2 \cdot (3x^2 + 2x - 9)}{(x^3 + 1)^2} = \frac{6x^4 + 6x + 2x^3 + 2 - 9x^4 - 6x^3 + 27x^2}{(x^3 + 1)^2} = \frac{-3x^4 - 4x^3 + 27x^2 + 6x + 2}{(x^3 + 1)^2}$
- $y = \ln(x^2 + 1)$ , misal  $u = x^2 + 1, y = \ln u$   
 $y' = \frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx} = \frac{1}{u} \cdot \frac{du}{dx} = \frac{1}{x^2 + 1} \cdot \frac{d(x^2 + 1)}{dx} = 2x \rightarrow y' = \frac{1}{x^2 + 1} \cdot 2x = \frac{2x}{x^2 + 1}$
- $y = \sin^3(3t + 2)$ , misal  $u = 3t + 2, w = \sin u, y = w^3$   
 $y' = \frac{dy}{dt} = \frac{dy}{dw} \cdot \frac{dw}{du} \cdot \frac{du}{dt} = 3w^2 \cdot \frac{dw}{du} \cdot \frac{du}{dt} = 3 \rightarrow y' = 3w^2 \cdot \cos u \cdot 3 = 9 \cdot \sin^2(3t + 2) \cdot \cos(3t + 2)$
- $y = \frac{1}{t+1}$ , misal  $u = 1, u' = 0, v = t + 1, v' = 1$   
 $y' = \frac{u'v - v'u}{v^2} = \frac{0 \cdot (t + 1) - 1 \cdot 1}{(t + 1)^2} = \frac{-1}{(t + 1)^2}$

Latihan Soal I.3

Temukan fungsi y jika :

- $y = \sin(3x + 2) \rightarrow \int \sin(3x + 2) dx = \frac{-\cos(3x+2)}{3} + c$
- $y = 5.9 \rightarrow \int 5.9 dx = 5.9x + c$
- $y = e^{-3t} \rightarrow \int e^{-3t} dt = \frac{e^{-3t}}{-3} + c = -\frac{e^{-3t}}{3} + c$
- $y = \frac{1}{x^5} \rightarrow \int \frac{1}{x^5} dx = \int x^{-5} dx = \frac{1}{-4}x^{-4} + c = -\frac{1}{4}x^{-4} + c = -\frac{1}{4x^4} + c$
- $y = 3t^2 - \sqrt{t} \rightarrow \int 3t^2 dt - \int t^{1/2} dt = t^3 - \frac{2}{3}t^{3/2} + c$
- $y = \frac{\sin x + \cos x}{2} = \frac{\sin x}{2} + \frac{\cos x}{2} \rightarrow \frac{1}{2} \int \sin x dx + \frac{1}{2} \int \cos x dx = -\frac{1}{2} \cos x + \frac{1}{2} \sin x + c$
- $y = 7 \operatorname{cosec} \left( \frac{\pi}{2} \right) \rightarrow \int 7 \operatorname{cosec} \left( \frac{\pi}{2} \right) dx = 7 \int \operatorname{cosec} \left( \frac{\pi}{2} \right) dx = 7 \frac{1}{0} \left\{ \ln \left| \operatorname{cosec} \left( \frac{\pi}{2} \right) - \cot \left( \frac{\pi}{2} \right) \right| \right\} + c = c$
- $y = 4 \cos(9x + 2) \rightarrow 4 \int \cos(9x + 2) dx = 4 \cdot \frac{\sin(9x+2)}{9} + c = \frac{4}{9} \sin(9x + 2) + c$
- $\int \cos^2 t dt = \int \frac{1 + \cos 2t}{2} dt = \int \frac{1}{2} dt + \frac{1}{2} \int \cos 2t dt = \frac{1}{2}t + \frac{1}{2} \cdot \frac{\sin 2t}{2} + c = \frac{1}{2}t + \frac{\sin 2t}{4} + c$
- $\int \sin^2 t dt = \int \frac{1 - \cos 2t}{2} dt = \int \frac{1}{2} dt - \frac{1}{2} \int \cos 2t dt = \frac{1}{2}t - \frac{1}{2} \cdot \frac{\sin 2t}{2} + c = \frac{1}{2}t - \frac{\sin 2t}{4} + c$
- $\int x e^{2x} dx$ , misal  $u = x, du = dx, dv = e^{2x} dx, v = \int e^{2x} dx = \frac{e^{2x}}{2}$   
 $\int u dv = u \cdot v - \int u'v = x \cdot \frac{e^{2x}}{2} - \int \frac{e^{2x}}{2} dx = \frac{x \cdot e^{2x}}{2} - \frac{e^{2x}}{4}$

12.  $\int e^t \sin t \, dt$ , misal  $u = e^t$ ,  $du = e^t \, dt$ ,  $dv = \sin t \, dt$ ,  $v = \int \sin t \, dt = -\cos t$   
 $\int u \, dv = u \cdot v - \int u'v = e^t \cdot (-\cos t) - \int e^t \cdot (-\cos t) \, dt = -e^t \cos t + \int e^t \cdot \cos t \, dt$   
 $\int e^t \cdot \cos t \, dt$ , misal  $u = e^t$ ,  $du = e^t \, dt$ ,  $dv = \cos t \, dt$ ,  $v = \int \cos t \, dt = \sin t$   
 $\int u \, dv = u \cdot v - \int u'v = e^t \cdot \sin t - \int e^t \cdot \sin t \, dt = e^t \cdot \sin t - \int e^t \cdot \sin t \, dt$   
 $\int e^t \sin t \, dt = -e^t \cos t + e^t \cdot \sin t - \int e^t \cdot \sin t \, dt \rightarrow 2 \cdot \int e^t \sin t \, dt = -e^t \cos t + e^t \cdot \sin t$   
 $\int e^t \sin t \, dt = \frac{-e^t \cos t + e^t \cdot \sin t}{2}$
13.  $\int (3x + 1)^5 dx$ , misal  $u = 3x + 1$ ,  $du = 3 \, dx$ ,  $dx = \frac{du}{3}$   
 $\int \frac{u^5 du}{3} = \frac{1}{3} \int u^5 du = \frac{1}{3} \cdot \frac{1}{6} u^6 + c = \frac{1}{18} (3x + 1)^6 + c$
14.  $\int_1^2 \sin t \cos^2 t \, dt$ , misal  $u = \cos t$ ,  $du = -\sin t \, dt$   
 $\int_1^2 \sin t \cos^2 t \, dt = - \int_1^2 u^2 \, du = \left[ -\frac{1}{3} u^3 \right]_1^2 = \left[ -\frac{1}{3} (\cos^3 t) \right]_1^2 = -\frac{1}{3} \cos^3(2) - \frac{1}{3} \cos^3(1)$
15.  $\int \frac{4}{(5x-7)} dx$ , misal  $u = 5x - 7$ ,  $du = 5 \, dx$ ,  $dx = \frac{du}{5}$   
 $\int \frac{4}{u} \cdot \frac{du}{5} = \frac{4}{5} \int \frac{1}{u} du = \frac{4}{5} \ln|u| + c = \frac{4}{5} \ln|5x - 7| + c$