W10 - P1

In[1]:=
```
Integrate[(3 x + 1)^5, x] + C
```

Out[1]=
$$C + \frac{1}{18}(1 + 3x)^6$$

In[2]:=
```
Integrate[(3 y^2 + 2) Exp[-(y^3 + 2 y)], y] + C
```

Out[2]=
$$C - e^{-2y-y^3}$$

W10 - P2

In[3]:=
```
Integrate[Sqrt[2 x - 1], x] + C
```

Out[3]=
$$C + \frac{1}{3}(-1 + 2x)^{3/2}$$

In[4]:=
```
Integrate[(1 - α) Exp[4 α - 2 α^2], α] + C
```

Out[4]=
$$C + \frac{1}{4} e^{-2(-2+\alpha)\alpha}$$

In[5]:=
```
Integrate[Cos[φ] Exp[2 Sin[φ]], φ] + C
```

Out[5]=
$$C + \frac{1}{2} e^{2\sin[\varphi]}$$

W10 - P3

In[6]:=
```
Assuming[θ > 0 && T > 0, Integrate[(2 J + 1) Exp[-J (J + 1) θ / T], {J, 0, ∞}]]
```

Out[6]=
$$\frac{T}{\theta}$$

W10 - P4

In[7]:=
```
Integrate[x/(3 x^2 - 2), {x, 1, 2}]
```

Out[7]=
$$\frac{\text{Log}[10]}{6}$$

In[8]:=
```
Integrate[Sin[Sqrt[x] + π]/Sqrt[x], {x, 0, π^2}]
```

Out[8]=
$$-4$$

In[9]:=
```
Integrate[Sqrt[Sin[θ]] Cos[θ], {θ, 0, π/2}]
```

Out[9]=
$$\frac{2}{3}$$

In[10]:= $\text{Integrate}\left[\frac{1}{\sqrt{2-x^2}}, \{x, 0, 1\}\right]$

Out[10]= $\frac{\pi}{4}$

In[11]:= $\text{Integrate}\left[x\,\text{Exp}\left[-x^2\right], \{x, 0, \infty\}\right]$

Out[11]= $\frac{1}{2}$

W10 - P5

In[12]:= $\text{Integrate}[x\,\text{Sin}[x], x] + C$

Out[12]= $C - x\,\text{Cos}[x] + \text{Sin}[x]$

In[13]:= $\text{Integrate}\left[x^3\,\text{Sin}[x], x\right] + C$

Out[13]= $C - x\left(-6+x^2\right)\text{Cos}[x] + 3\left(-2+x^2\right)\text{Sin}[x]$

In[14]:= $\text{Integrate}\left[(x+1)^2\,\text{Cos}[2x], x\right] + C$

Out[14]= $C + \frac{1}{2}(1+x)\,\text{Cos}[2x] + \frac{1}{4}\left(1+4x+2x^2\right)\text{Sin}[2x]$

In[15]:= $\text{Integrate}\left[x^2\,\text{Exp}[2x], x\right] + C$

Out[15]= $C + \frac{1}{4}e^{2x}\left(1-2x+2x^2\right)$

In[16]:= $\text{Integrate}[x\,\text{Exp}[x], \{x, 0, 1\}]$

Out[16]= 1

In[17]:= $\text{Integrate}\left[x^2\,\text{Exp}[-2x], \{x, 0, \infty\}\right]$

Out[17]= $\frac{1}{4}$

In[18]:= $\text{Integrate}[x\,\text{Log}[x], x] + C$

Out[18]= $C - \frac{x^2}{4} + \frac{1}{2}x^2\,\text{Log}[x]$

In[19]:= $\text{Integrate}\left[\frac{\text{Log}[x]}{x^2}, x\right] + C$

Out[19]= $C - \frac{1}{x} - \frac{\text{Log}[x]}{x}$

W10 - P6

In[20]:= $\text{Integrate}\left[\frac{1}{\text{Cos}[x]}, x\right] + C$

Out[20]= $C - \text{Log}\left[\text{Cos}\left[\frac{x}{2}\right] - \text{Sin}\left[\frac{x}{2}\right]\right] + \text{Log}\left[\text{Cos}\left[\frac{x}{2}\right] + \text{Sin}\left[\frac{x}{2}\right]\right]$