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> with(IntegrationTools) :
> with(Student[Calculus1]) :
> # We start with the Parts command needed for Q1
> # By looking at the documentation, we see that Parts(t, u) requires 2 parameters
> # t is an expression containing an integral while u is the u-term used for the IBP formula
> # For t, we need to use the Int command (note the capital I!)
> # The Int command works exactly like the int command, except that it doesn't actually evaluate
    the integral
> f := x→exp(x)·x^2
```

$$f := x \mapsto e^x x^2 \tag{1}$$

```
> ind_int := Int(f(x), x)
```

$$ind\_int := \int e^x x^2 \, dx \tag{2}$$

```
> def_int := Int(f(x), x = 0..1)
```

$$def\_int := \int_0^1 e^x x^2 \, dx \tag{3}$$

```
> # These are integral expressions that can be used with the Parts command
> Parts(ind_int, x^2)
```

$$e^x x^2 - \left(\int 2 x e^x \, dx \right) \tag{4}$$

```
> Parts(ind_int, exp(x))
```

$$\frac{x^3 e^x}{3} - \left(\int \frac{x^3 e^x}{3} \, dx \right) \tag{5}$$

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>
>
> # Next, we'll look at the Integration Tutor  that comes with the Calculus 1 package
> # First, we need to define an algebraic expression (without the x -> part)
> g := exp(x)·x^2
```

$$g := e^x x^2 \tag{6}$$

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> # After evaluating the line, you should see a variety of options on the right-hand side of the
    Maple Window
> # Click Student Calculus 1  > Tutors > Integration Methods which will open a new window
> # Make sure that the integral settings at the top of the window are correct·(especially for Q3 which
    uses a different variable instead of x, and is a definite integral)
> # If you made any changes to the settings, press start, then press All Steps and wait for Maple to
    finish evaluating the integral
> # Once done, you can click close and the steps to solve the integral should appear in your
    worksheet
> Student:-Calculus1:-IntTutor(exp(x) * x^2)
```

$$\int e^x x^2 \, dx$$

$$= e^x x^2 - \left(\int 2 x e^x \, dx \right) \qquad [parts, x^2, e^x]$$

$$= e^x x^2 - 2 \left(\int x e^x \, dx \right) \qquad [constantmultiple]$$

$$= e^x x^2 - 2 x e^x + 2 \left(\int e^x \, dx \right) \qquad [parts, x, e^x]$$

$$= e^x x^2 - 2 x e^x + 2 e^x \qquad [\exp]$$

$$\int e^x x^2 \, dx = e^x x^2 - 2 x e^x + 2 e^x \qquad \textbf{(7)}$$

> *Student:-Calculus1:-IntTutor*(exp(*y*) * *y*^2)

$$\int_0^1 e^y y^2 \, dy$$

$$= e - \left(\int_0^1 2 e^y y \, dy \right) \qquad [parts, y^2, e^y]$$

$$= e - 2 \left(\int_0^1 e^y y \, dy \right) \qquad [constantmultiple]$$

$$= -e + 2 \left(\int_0^1 e^y \, dy \right) \qquad [parts, y, e^y]$$

$$= e - 2 \qquad [\exp]$$

$$\int_0^1 e^y y^2 \, dy = e - 2 \qquad \textbf{(8)}$$

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