

MAT120
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Section 03
Set 18
Lab Assignment

1. Evaluate the following

In[2]:=  `Integrate[\frac{x}{(4x^2+1)^3}, x]`

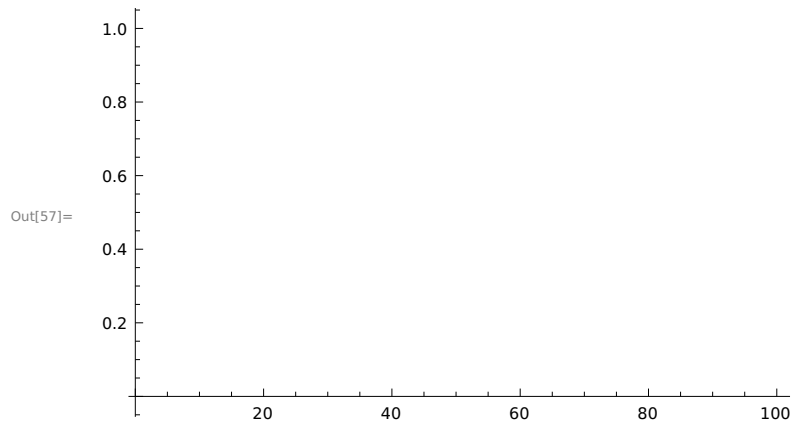
Out[2]=
$$-\frac{1}{16(1+4x^2)^2}$$

2. Integrate the following and plot the result that comes from the integration

In[59]:= `Integrate[(x ^{-1/3}), {x, -1, 8}]`

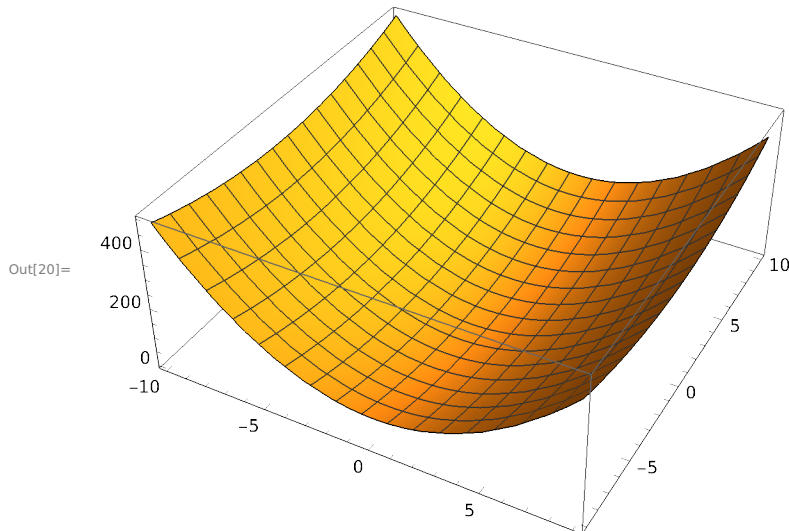
Out[59]=
$$\left\{6 - \frac{3}{2}(-1)^{2/3}\right\}$$

In[57]:= `Plot[6 - \frac{3}{2}(-1)^{2/3}, {k, 1, 100}]`



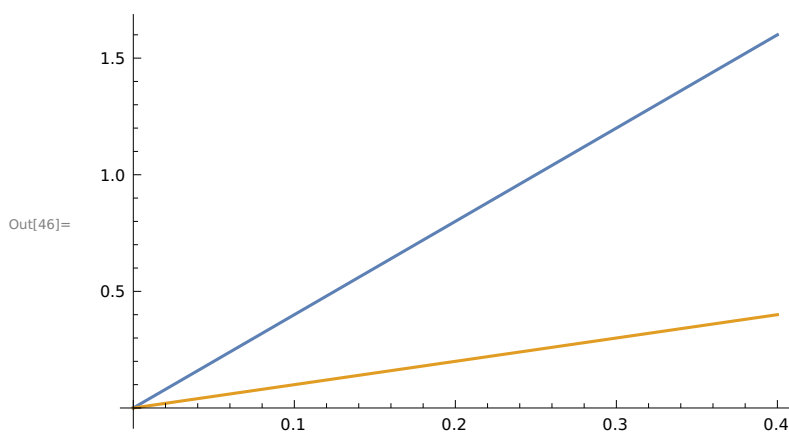
3. Plot the multi-variable $f(x,y) = 4x^2 + y^2$ function when $-10 \leq x \leq 9, -9 \leq y \leq 10$

In[20]:= `Plot3D[(4 * x ^ 2 + y ^ 2), {x, - 10, 9}, {y, - 9, 10}]`



4. Find the area of the region bounded by the curves $y = 4x$ and $y = x$ when $0 \leq x \leq 2/5$

In[46]:= `Plot[{(4 x), x}, {x, 0, (2 / 5)}, Filling -> {{1) -> {{2}}, {Green, None}}}, PlotStyle -> Automatic]`



5. Solve the following differential equation and plot it's solution

```
In[49]:= DSolve[{x * y'[x] - 10 * y'[x] + 25 * y[x] == 0}, y[x], {x, 1, 2}]
```

```
Out[49]= {{y[x] -> 97 656 250 x^{11/2} (19 958 400 BesselJ[11, 10 \sqrt{x}] c_1 - i BesselY[11, 10 \sqrt{x}] c_2)}}}
```

```
In[50]:= solution = DSolveValue[{x * y'[x] - 10 * y'[x] + 25 * y[x] == 0}, y[x], {x, 1, 2}];
```

```
soltable = Table[solution /. {C[1] -> m, C[2] -> n}, {m, 0, 5}, {n, 0, 5}];
```

```
Plot[soltable, {x, -5, 6}, PlotRange -> Automatic]
```

```
Out[52]=
```

