In[1]:=
```
(A + B * (s^2 / (s^2 + W1/C * s + W1^2)))
```

Out[1]=
$$A + \frac{B\,s^2}{s^2 + \frac{s\,W1}{C} + W1^2}$$

In[2]:=
```
Together[ExpandAll[%]]
```

Out[2]=
$$\frac{A\,C\,s^2 + B\,C\,s^2 + A\,s\,W1 + A\,C\,W1^2}{C\,s^2 + s\,W1 + C\,W1^2}$$

In[3]:=
```
Expand[Numerator[%2]]
```

Out[3]=
$$A\,C\,s^2 + B\,C\,s^2 + A\,s\,W1 + A\,C\,W1^2$$

In[4]:=
```
Expand[Denominator[%2]]
```

Out[4]=
$$C\,s^2 + s\,W1 + C\,W1^2$$

In[5]:=
```
Collect[Expand[%3 / C], s]
```

Out[5]=
$$(A + B)\,s^2 + \frac{A\,s\,W1}{C} + A\,W1^2$$

In[6]:=
```
Collect[Expand[%4 / C], s]
```

Out[6]=
$$s^2 + \frac{s\,W1}{C} + W1^2$$

In[7]:=
```
%5 / %6
```

Out[7]=
$$\frac{(A + B)\,s^2 + \frac{A\,s\,W1}{C} + A\,W1^2}{s^2 + \frac{s\,W1}{C} + W1^2}$$

In[8]:=
```
filter = %7
```

Out[8]=
$$\frac{(A + B)\,s^2 + \frac{A\,s\,W1}{C} + A\,W1^2}{s^2 + \frac{s\,W1}{C} + W1^2}$$

In[9]:=
```
s = P (z - 1)/(z + 1)
```

Out[9]=
$$\frac{P\,(-1 + z)}{1 + z}$$

In[10]:=
```
filter
```

Out[10]=
$$\frac{A\,W1^2 + \frac{(A+B)\,P^2\,(-1+z)^2}{(1+z)^2} + \frac{A\,P\,W1\,(-1+z)}{C\,(1+z)}}{W1^2 + \frac{P^2\,(-1+z)^2}{(1+z)^2} + \frac{P\,W1\,(-1+z)}{C\,(1+z)}}$$

In[11]:=
```
Together[ExpandAll[%]]
```

Out[11]=
$$(A\,C\,P^2 + B\,C\,P^2 - A\,P\,W1 + A\,C\,W1^2 - 2\,A\,C\,P^2\,z - 2\,B\,C\,P^2\,z + 2\,A\,C\,W1^2\,z + A\,C\,P^2\,z^2 + B\,C\,P^2\,z^2 + A\,P\,W1\,z^2 + A\,C\,W1^2\,z^2) / (C\,P^2 - P\,W1 + C\,W1^2 - 2\,C\,P^2\,z + 2\,C\,W1^2\,z + C\,P^2\,z^2 + P\,W1\,z^2 + C\,W1^2\,z^2)$$

In[12]:= **Collect[Numerator[%11], z]**

Out[12]= $A C P^2 + B C P^2 - A P W1 + A C W1^2 + (-2 A C P^2 - 2 B C P^2 + 2 A C W1^2)\, z + (A C P^2 + B C P^2 + A P W1 + A C W1^2)\, z^2$

In[13]:= **Collect[Denominator[%11], z]**

Out[13]= $C P^2 - P W1 + C W1^2 + (-2 C P^2 + 2 C W1^2)\, z + (C P^2 + P W1 + C W1^2)\, z^2$

In[16]:= **Collect[%12 / (C P^2 + P W1 + C W1^2), z]**

Out[16]= $$\frac{A C P^2 + B C P^2 - A P W1 + A C W1^2}{C P^2 + P W1 + C W1^2} + \frac{(-2 A C P^2 - 2 B C P^2 + 2 A C W1^2)\, z}{C P^2 + P W1 + C W1^2} + \frac{(A C P^2 + B C P^2 + A P W1 + A C W1^2)\, z^2}{C P^2 + P W1 + C W1^2}$$

In[17]:= **Collect[%13 / (C P^2 + P W1 + C W1^2), z]**

Out[17]= $$\frac{C P^2 - P W1 + C W1^2}{C P^2 + P W1 + C W1^2} + \frac{(-2 C P^2 + 2 C W1^2)\, z}{C P^2 + P W1 + C W1^2} + z^2$$