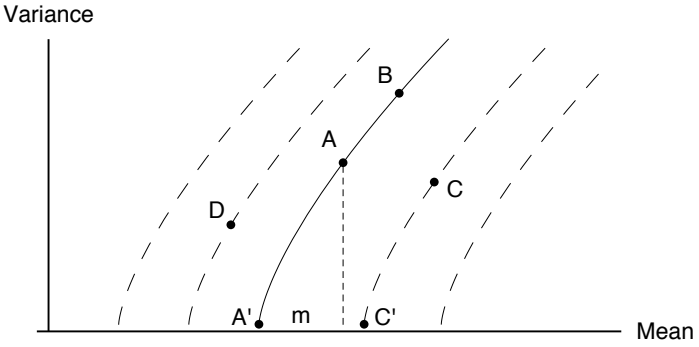
In[1]:=
```
thinn = AbsoluteThickness[.5];
medum = AbsoluteThickness[1.];
thick = AbsoluteThickness[1.5];
black = GrayLevel[0];
BGray = GrayLevel[0.3];
WGray = GrayLevel[0.6];
SetOptions[Plot, PlotStyle → {{thinn, Black}, {thinn, Black}, {thinn, Black}},
  PlotPoints → 40, ImageSize → 360,
  FrameStyle -> medum, AxesStyle -> medum,
  BaseStyle -> {FontFamily -> "Helvetica", FontSlant → Plain, FontSize → 12}];
SetOptions[ListPlot, AxesStyle -> medum, PlotStyle → medum, ImageSize → 360,
  BaseStyle -> {FontFamily -> "Helvetica", FontSlant -> "Plain", FontSize → 12}];
SetOptions[ParametricPlot, PlotStyle →
   {{thinn, Black}, {thinn, Black}, {thinn, Black}}, PlotPoints → 40,
  FrameStyle -> medum, AxesStyle -> medum, PlotStyle → medum,
  BaseStyle -> {FontFamily -> "Helvetica", FontSlant -> "Plain", FontSize → 12}];
SetOptions[Graphics, BaseStyle ->
   {FontFamily -> "Helvetica", FontSlant -> "Plain", FontSize → 12}];
```

Figure 4.4

In[11]:=
```
c1 = (r - 0.4) ^ 0.7;
c2 = (r - 0.5) ^ 0.7;
c3 = (r - 0.65) ^ 0.7;
c4 = (r - 0.3) ^ 0.7;
c5 = (r - 0.76) ^ 0.7;
ta = c2 /. r → .62;
tb = c2 /. r → .7;
tc = c3 /. r → .75;
td = c1 /. r → .46;
a = {0.62, ta};
b = {0.7, tb};
c = {0.75, tc};
d = {0.46, td};
ap = {0.5, 0.}; cp = {0.65, 0.};
```

In[25]:=
```
pl44a = Plot[{c1, c2, c3, c4, c5}, {r, 0.2, 1},
    PlotRange → {-0.01, .4},
    AxesOrigin → {0.2, -0.01},
    AxesLabel → {"Mean", "Variance"},
    Ticks → False, PlotStyle → {
      {Dashing[0.03], thinn, Black},
      {thinn, Black},
      {Dashing[0.03], thinn, Black},
      {Dashing[0.03], thinn, Black},
      {Dashing[0.03], thinn, Black}}
  ];
fig44 = Show[
  pl44a,
  Graphics[{Dashing[{0.01}], thinn, Line[{{0.62, 0.}, {0.62, ta}}]}],
  Graphics[ {PointSize[0.015], Point[{a}]}],
  Graphics[ {PointSize[0.015], Point[{b}]}],
  Graphics[ {PointSize[0.015], Point[{c}]}],
  Graphics[ {PointSize[0.015], Point[{d}]}],
  Graphics[ {PointSize[0.015], Point[{ap}]}],
  Graphics[ {PointSize[0.015], Point[{cp}]}],
  Graphics[Text["A", {0.6, 0.26}]],
  Graphics[Text["B", {0.68, 0.35}]],
  Graphics[Text["C", {0.78, 0.19}]],
  Graphics[Text["D", {0.44, 0.16}]],
  Graphics[Text["m", {0.56, 0.01}]],
  Graphics[Text["A'", {0.475, 0.01}]],
  Graphics[Text["C'", {0.68, 0.01}]],
  ImageSize → 360, AspectRatio → 0.5
 ]
```

Out[26]=



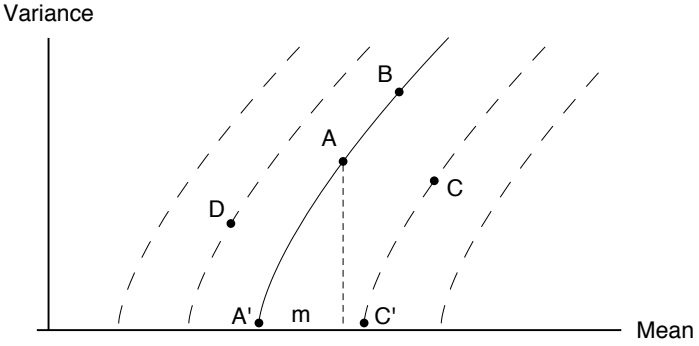
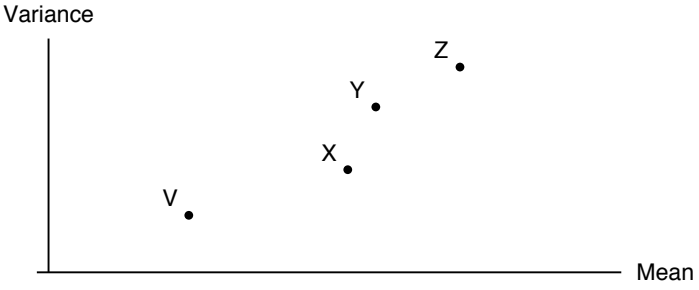


Figure 4.5

In[27]:=
```
v = {.45, .09};
x = {.62, .17};
y = {.65, .28};
z = {.74, .35};
vv = {.43, .12};
xx = {.60, .2};
yy = {.63, .31};
zz = {.72, .38};
pl45a = Plot[{None}, {r, 0.3, 0.9},
    PlotRange → {-0.01, .4},
    AxesOrigin → {0.3, -0.01},
    AxesLabel → {"Mean", "Variance"},
    Ticks → False, PlotStyle → {
      {Dashing[0.03], thinn, Black},
      {thinn, Black},
      {Dashing[0.03], thinn, Black},
      {Dashing[0.03], thinn, Black},
      {Dashing[0.03], thinn, Black}}
  ];
fig45 = Show[
  pl45a,
  Graphics[ {PointSize[0.015], Point[{v}]}],
  Graphics[ {PointSize[0.015], Point[{x}]}],
  Graphics[ {PointSize[0.015], Point[{y}]}],
  Graphics[ {PointSize[0.015], Point[{z}]}],
  Graphics[Text["V", vv]],
  Graphics[Text["X", xx]],
  Graphics[Text["Y", yy]],
  Graphics[Text["Z", zz]],
  ImageSize → 360, AspectRatio → 0.4
 ]
```

Out[36]=



for Table 4.2 and Figure 4.6

In[37]:=
```
ev1 = 0.9 × 200 + 0.1 × 120
```

Out[37]=
```
192.
```

In[38]:=
```
ev2 = 0.9 × 200 + 0.1 × 160
```
Out[38]=
```
196.
```

In[39]:=
```
0.9 × 199./200. + 0.1 × 119./120.
```
Out[39]=
```
0.994667
```

In[40]:=
```
0.9 × 199./200. + 0.1 × 159./160.
```
Out[40]=
```
0.994875
```

Risk premium

In[41]:=
```
Solve[0.9 × 199./200. + 0.1 × 119./120. == (ev1 - 1. - rp)/(ev1 - rp), rp]
```
Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. ≫

Out[41]=
```
{{rp → 4.5}}
```

Option price; wtp & wta

In[42]:=
```
Solve[0.9 × 199./200. + 0.1 × 119./120. == 0.9 × (199. - op)/(200. - op) + 0.1 × (159. - op)/(160. - op), op]
```
Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. ≫

Out[42]=
```
{{op → 7.57941}, {op → 164.921}}
```

In[43]:=
```
Solve[0.9 × (199. + op)/(200. + op) + 0.1 × (119. + op)/(120. + op) == 0.9 × 199./200. + 0.1 × 159./160., op]
```
Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. ≫

Out[43]=
```
{{op → -132.255}, {op → 7.37674}}
```

In[44]:=
```
op = 7.57941
```
Out[44]=
```
7.57941
```

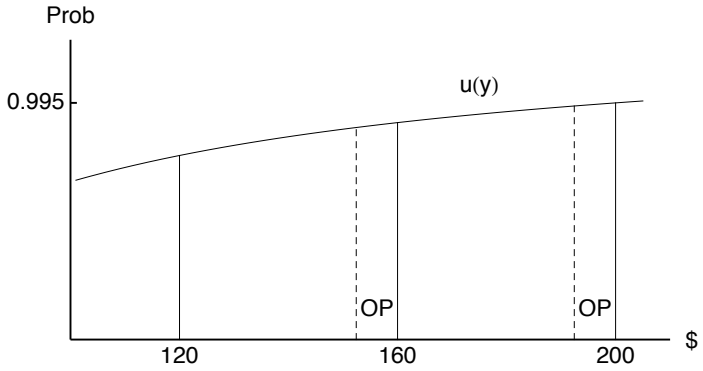
Figure

dash the two -OP lines

In[45]:=
```
y = .;
u = (y - 1)/y;
a = {120., u /. y → 120.};
b = {160. - op, u /. y → 160. - op};
c = {160., u /. y → 160.};
d = {200. - op, u /. y → 200. - op};
e = {200., u /. y → 200.};
```

In[52]:=
```
pl46a = Plot[u, {y, 101, 205.},
    AxesLabel → {"$", "Prob"},
    PlotRange → {{100, 210}, {0.98, .999}},
    Ticks → {{
        {120, "120", {0., 0.}},
        {160, "160", {0., 0.}},
        {200, "200", {0., 0.}}},
      {0.995}}];
fig46 = Show[pl46a,
  Graphics[{thinn, Line[{{120., 0.98}, a}]}],
  Graphics[{Dashing[{0.01}], thinn, Line[{{160. - op, 0.98}, b}]}],
  Graphics[{thinn, Line[{{160., 0.98}, c}]}],
  Graphics[{Dashing[{0.01}], thinn, Line[{{200. - op, 0.98}, d}]}],
  Graphics[{thinn, Line[{{200., 0.98}, e}]}],
  Graphics[Text["OP", {160. - 3.75, .982}]],
  Graphics[Text["OP", {200. - 3.75, .982}]],
  Graphics[Text["u(y)", {175., .996}]],
  ImageSize → 360, AspectRatio → 0.5
 ]
```

Out[53]=



Certainty Equivalents

In[54]:=
```
Solve[0.9 × 199./200. + 0.1 × 119./120. == (ce - 1.)/ce, ce]
```

Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. ≫

Out[54]=
```
{{ce → 187.5}}
```

In[55]:=
$$\text{Solve}\left[0.9 \times \frac{199.}{200.} + 0.1 \times \frac{159.}{160.} == \frac{ce - 1.}{ce}, ce\right]$$

Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact system and numericizing the result. ≫

Out[55]= {{ce → 195.122}}

In[56]:= 195.122 - 187.5

Out[56]= 7.622