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In[121]:= N0 = 10 000;
          beta = 0.001; (*0.01;*)
          gamma = 9.5; (*9.5;*)
          gamma / beta
          S0 = 9995;
          I0 = 5; (*5*)
          R0 = N0 - S0 - I0;

Out[124]= 9500.

In[128]:= beta * N0 / gamma
Out[128]= 1.05263

In[129]:= tend = 40;
          alpha =
            (((S0 * beta / gamma) - 1) ^ 2 + (2 * S0 * (N0 - S0) * beta ^ 2 / (gamma ^ 2))) ^ (1 / 2);
          phi = ArcTanh[(1 / alpha) * ((S0 * beta / gamma) - 1)];

In[132]:= S = .; I = .; R = .;

In[133]:= f[t_] =
            (alpha ^ 2 * gamma ^ 3 * (Sech[0.5 * alpha * gamma * t - phi]) ^ 2) / (2 * S0 * beta ^ 2);
          g[t_] = (gamma ^ 2 / (S0 * beta ^ 2)) *
            (S0 * beta / gamma - 1 + alpha * Tanh[0.5 * alpha * gamma * t - phi]);

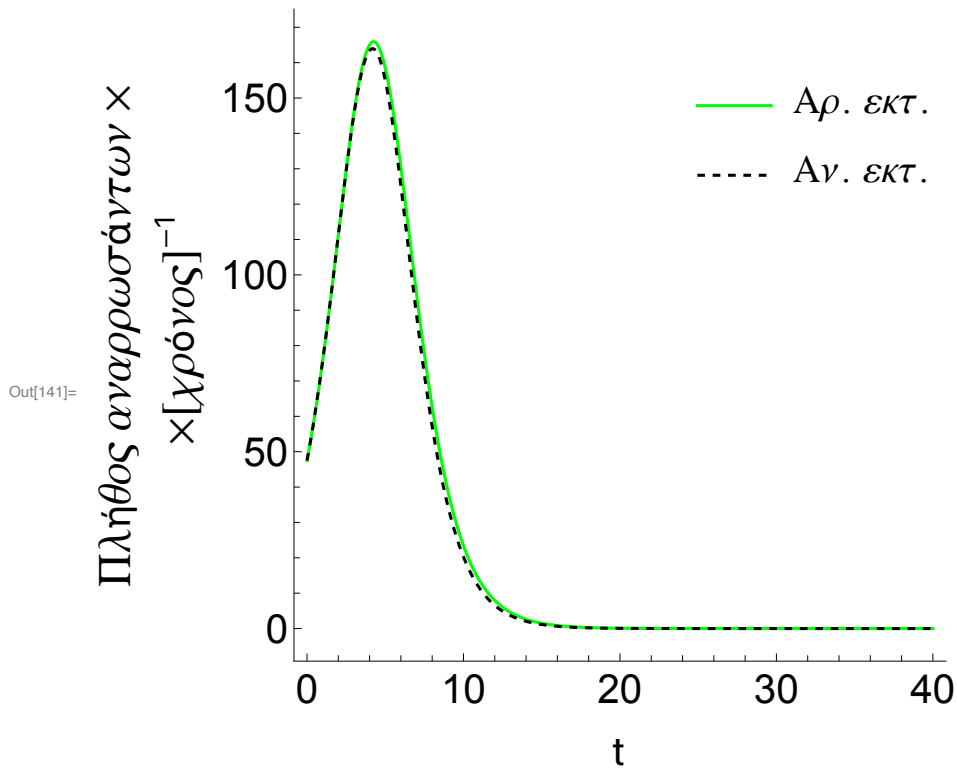
In[135]:= p1 = Plot[f[t], {t, 0, tend}, PlotStyle -> {Black, Dashed}, PlotRange -> All,
            FrameLabel -> {Style["t", FontFamily -> "MS Serif", FontSize -> 21],
              Style["...sech(...)", FontFamily -> "MS Serif", FontSize -> 21]},
            RotateLabel -> True, Frame -> {{Automatic, False}, {Automatic, False}}];
          p2 = Plot[g[t], {t, 0, tend}, PlotStyle -> {Black, Dashed}, PlotRange -> All,
            FrameLabel -> {Style["t", FontFamily -> "MS Serif", FontSize -> 21],
              Style["...", FontFamily -> "MS Serif", FontSize -> 21]},
            RotateLabel -> True, Frame -> {{Automatic, False}, {Automatic, False}}];

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In[137]:= Sol = NDSolve[{D[S[t], t] == -beta * S[t] * I[t],
  D[I[t], t] == beta * S[t] * I[t] - gamma * I[t], D[R[t], t] == gamma * I[t],
  S[0] == S0, I[0] == I0, R[0] == R0}, {S, I, R}, {t, 0, tend}];
PlotgammaI =
  Plot[Evaluate[gamma * I[t] /. First[Sol]], {t, 0, tend}, PlotPoints -> 200,
  AxesLabel -> {t, I}, RotateLabel -> True, PlotRange -> All, PlotStyle -> Green];
PlotI = Plot[Evaluate[I[t] /. First[Sol]], {t, 0, tend}, PlotPoints -> 200,
  Mesh -> False, AxesLabel -> {t, I}, PlotRange -> All, PlotStyle -> Red,
  FrameLabel -> {Style["t", FontFamily -> "MS Serif", FontSize -> 18],
  Style["I", FontFamily -> "MS Serif", FontSize -> 21]},
  RotateLabel -> True, Frame -> {{Automatic, False}, {Automatic, False}}];
PlotR = Plot[Evaluate[R[t] /. First[Sol]], {t, 0, tend}, PlotPoints -> 200,
  Mesh -> False, AxesLabel -> {t, R}, PlotRange -> All, PlotStyle -> Green,
  FrameLabel -> {Style["t", FontFamily -> "MS Serif", FontSize -> 21],
  Style["R", FontFamily -> "MS Serif", FontSize -> 21]},
  RotateLabel -> True, Frame -> {{Automatic, False}, {Automatic, False}}];
MP0 = Show[PlotgammaI, p1, PlotRange -> All, MaxRecursion -> 0,
  PlotPoints -> {200, 100}, AspectRatio -> 1, AxesOrigin -> {0, 0},
  RotateLabel -> True, LabelStyle -> {21, GrayLevel[0]},
  FrameLabel -> {Style["t", FontFamily -> "MS Serif", FontSize -> 21],
  Style["Πλήθος αναρρωσάντων x\ n x[χρόνος]-1", FontFamily -> "MS Serif",
  FontSize -> 21]}, RotateLabel -> True, Epilog -> Inset[Column[
  {LineLegend[{Green, {Black, Dashed}}, {"Αρ. εκτ.", "Αν. εκτ."}, LabelStyle ->
  {FontFamily -> "Times New Roman", FontSize -> 21, FontSlant -> Italic}]}],
  Scaled[{0.8, 0.8}]], Frame -> {{Automatic, False}, {Automatic, False}},
  ImageSize -> {450, 450}, AspectRatio -> Full, PlotLabel -> None,
  LabelStyle -> {21, GrayLevel[0]}]

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In[142]:= MP1 = Show[PlotR, p2, PlotRange → All, MaxRecursion → 0,
  PlotPoints → {200, 100}, AspectRatio → 1, AxesOrigin → {0, 0},
  RotateLabel → True, LabelStyle → {21, GrayLevel[0]},
  FrameLabel → {Style["t", FontFamily → "MS Serif", FontSize → 21],
    Style["Πλήθος αναρρωσάντων", FontFamily → "MS Serif", FontSize → 21]},
  RotateLabel → True, Epilog → Inset[Column[
    {LineLegend[{{Green, {Black, Dashed}}, {"Αρ. εκτ.", "Αν. εκτ."}, LabelStyle →
      {FontFamily → "Times New Roman", FontSize → 21, FontSlant → Italic}}]},
    Scaled[{0.8, 0.8}]], Frame → {{Automatic, False}, {Automatic, False}},
  ImageSize → {450, 450}, AspectRatio → Full, PlotLabel → None,
  LabelStyle → {21, GrayLevel[0]}]

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Out[142]=

