



ES100

April 19, 1999

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Points of Discussion

- Review extra credit guidelines
- More accurate **numerical integration** for energy and distance
- Use of **switch** structure in place of if-blocks
- Using **while** and **switch** for the parametric study
- Workshop discussion

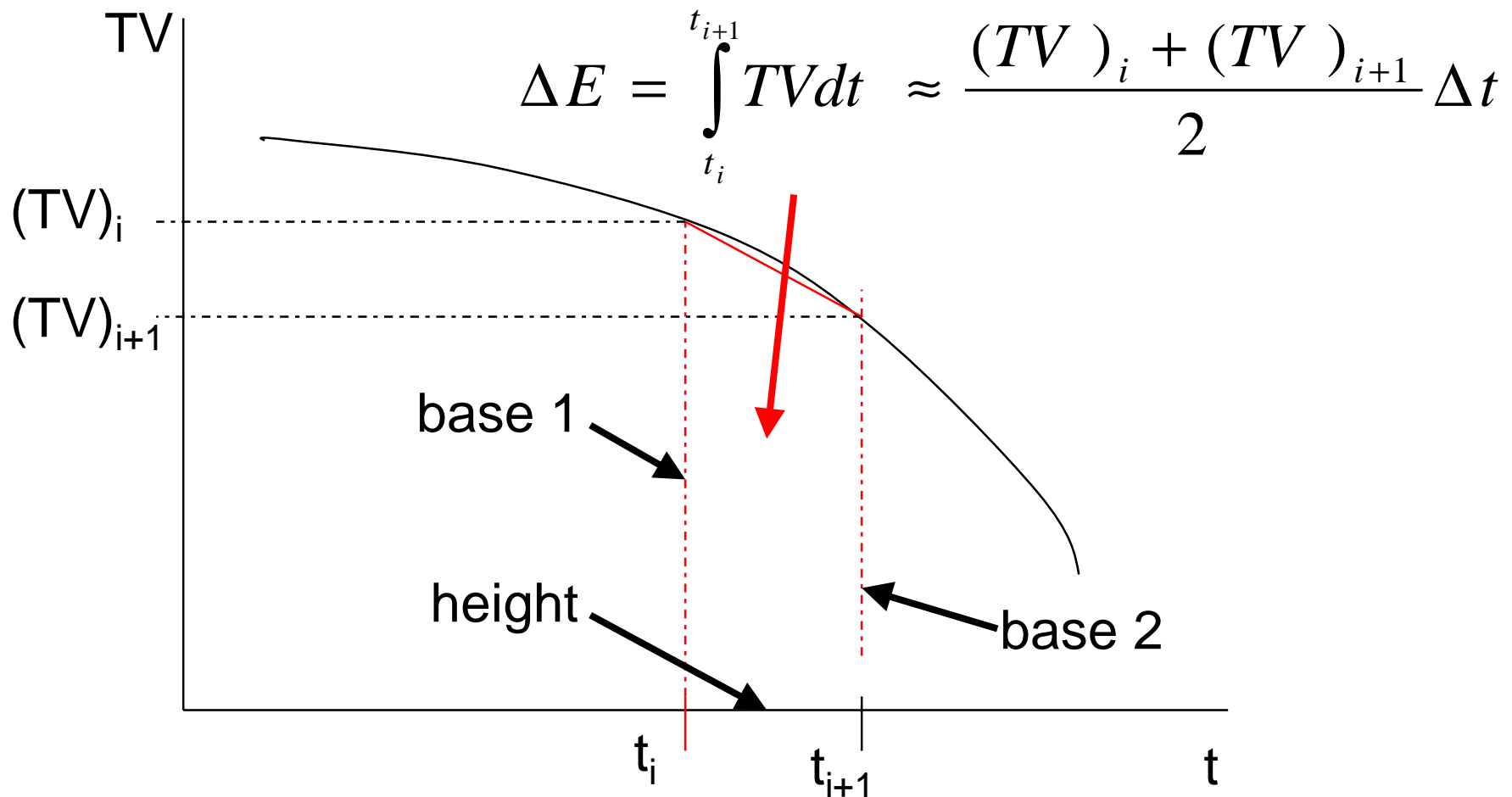
Extra Credit Guidelines

- The extra credit will be worth 10 pts
- Register with instructor before next Monday's lecture, April 19th
- The extra credit problem will be graded on an, *all or nothing* basis.
- The work is due on Monday, April 26
- The problem assigned for extra credit is 6.3.3, parts a and b.
- The problem must be the sole effort of one person.

Numerical Integration

“Trapezoidal Rule”

Area = (average base)(height)



How It Could Be Done

$V_L = V;$ **% Save current V**

$V = V + a*dt;$ **% Find new V**

...

$T_L = T;$ **% Save current T**

$T = \dots ;$ **% Find new T**

$E = E + 0.5*(T_L*V_L + T*V)*dt;$ **% Trap. Rule**

Switch Structure

```
switch input expression (scalar or string)
  case value 1
    statement group 1
  case value 2
    statement group 2
    ...
  otherwise (optional)
    statement group n
end
```

SWITCH example

```
switch angle
  case 45
    disp( 'Northeast' )
  case 135
    disp( 'Southeast' )
  case 225
    disp( 'Southwest' )
  case 315
    disp( 'Northwest' )
  otherwise
    disp( 'Direction unknown' )
end
```

SWITCH example II

```
switch angle
  case {0,360}
    disp( 'North' )
  case {90,-270}
    disp( 'East' )
  case {-180,180}
    disp( 'South' )
  case {-90,270}
    disp( 'West' )
  otherwise
    disp( 'Non-cardinal heading' )
end
```

Multiple conditions may exist for a single case by enclosing multiple values inside cell array brackets.

Parametric Study: A Way

```
% VPARAM.M calls VEHICLE.M to do the parametric study
% Here's where you initialize
while choice < 3
    clc      % Otherwise the printing scrolls down
    % Menu here: choice=1, CD study; choice=2, mass
    choice = input ('Enter number of choice: ');
    switch choice
        case 1    % Case 1: drag coefficient (mass constant)
            % Enter CD(i) and M and call simulation
            ED(i) = vehicle (CD(i), M);
            % Here's where you print results and maybe
            % count the next case
        case 2    % Case 2: mass (drag coefficient constant)
            % Coding similar to case 1
    end
end
end
```