



## PMP Formulas

Earned Value	
CV	$EV - AC$
CPI	$EV / AC$
SV	$EV - PV$
SPI	$EV / PV$
EAC 'no variances'	$BAC / CPI$
EAC 'fundamentally flawed'	$AC + ETC$
EAC 'atypical'	$AC + BAC - EV$
EAC 'typical'	$AC + ((BAC - EV) / CPI)$
ETC	$EAC - AC$
ETC 'atypical'	$BAC - EV$
ETC 'typical'	$(BAC - EV) / CPI$
ETC 'flawed'	new estimate
Percent Complete	$EV / BAC * 100$
VAC	$BAC - EAC$
EV	$\% \text{ complete} * BAC$
% COMPLETE	$EV / BAC * 100$
% SPENT	$AC / BAC * 100$
CV%	$CV / EV * 100$
SV%	$SV / PV * 100$
PERT	
PERT 3-point	$(Pessimistic + (4 * Most Likely) + Optimistic) / 6$
PERT $\alpha$	$(Pessimistic - Optimistic) / 6$
PERT Activity Variance	$((Pessimistic - Optimistic) / 6)^2$
PERT Variance all activities	$\_sum((Pessimistic - Optimistic) / 6)^2$
Classes of Estimates	
Order of Magnitude estimate	$-25\% \text{ to } +75\%$
Preliminary estimate	$-15\% \text{ to } +50\%$
Budget estimate	$-10\% \text{ to } +25\%$
Definitive estimate	$-5\% \text{ to } +10\%$
Final estimate	$0\%$



Project Selection
$PV = FV / (1+r)^n$
$FV = PV * (1+r)^n$
NPV = Select biggest number.
ROI = Select biggest number.
IRR = Select biggest number.
Payback Period = Add up the projected cash inflow minus expenses until you reach the initial investment.
BCR = Benefit / Cost
CBR = Cost / Benefit
Opportunity Cost = The value of the project not chosen.
Exp. Value = Probability % x Consequence \$

Communications
Communication Channels = $n * (n-1) / 2$

Probability
EMV = Probability * Impact in currency

Procurement
PTA = $((\text{Ceiling Price} - \text{Target Price}) / \text{Buyer's Share Ratio}) + \text{Target Cost}$

Depreciation
Straight-line Depreciation: $\text{Depr. Expense} = \text{Asset Cost} / \text{Useful Life}$ $\text{Depr. Rate} = 100\% / \text{Useful Life}$
Double Declining Balance Method: $\text{Depr. Rate} = 2 * (100\% / \text{Useful Life})$ $\text{Depr. Expense} = \text{Depreciation Rate} * \text{Book Value at Beginning of Year}$ $\text{Book Value} = \text{Book Value at beginning of year} - \text{Depreciation Expense}$
Sum-of-Years' Digits Method: $\text{Sum of digits} = \text{Useful Life} + (\text{Useful Life} - 1) + (\text{Useful Life} - 2) + \text{etc.}$ $\text{Depr. rate} = \text{fraction of years left and sum of the digits (i.e. 4/15th)}$



SIGMA
1 sigma = 68.26%
2 sigma = 95.46%
3 sigma = 99.73%
6 sigma = 99.99%

Important Values
Control Limits = 3 sigma from mean
Control Specifications = Defined by customer; less than the control limits
Float on the critical path = 0 days
Pareto Diagram = 80/20
Time a PM spends communicating = 90%
Crashing a project = Crash least expensive tasks on critical path.
JIT inventory = 0% (or very close to 0%.)

Network Diagram										
<p><b>Forward Pass</b></p> <p>ES = EF of the predecessor node</p> <p>EF = ES + Dur</p>	<table border="1"> <tr> <td>ES</td> <td>Dur</td> <td>EF</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Node</b></td> </tr> <tr> <td>LS</td> <td>Float</td> <td>LF</td> </tr> </table>	ES	Dur	EF	<b>Node</b>			LS	Float	LF
ES		Dur	EF							
<b>Node</b>										
LS	Float	LF								
<p><b>Backward Pass</b></p> <p>LF = LS of the Successor</p> <p>LS = LF - Dur</p> <p>Slack = LF - EF = LS - ES</p> <p>Free Float = ES(Successor) - EF(Predecessor)</p>										

*You need to understand the formulas not only memorize them*

*Refer to the PMBoK 4<sup>th</sup> Edition for more details*

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