



PM Exam Formula Cheat Sheet by BrainBOK

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Earned Value Management (EVM)

Earned Value (EV)	$EV = \% \text{ Complete} \times BAC$	Budgeted cost of work performed
Planned Value (PV)	$PV = \text{Planned } \% \text{ Complete} \times BAC$	Budgeted cost of work scheduled
Cost Variance (CV)	$CV = EV - AC$	+ve = under budget; -ve = over budget
Schedule Variance (SV)	$SV = EV - PV$	+ve = ahead; -ve = behind schedule
Cost Performance Index (CPI)	$CPI = EV / AC$	> 1 = under budget; < 1 = over budget
Schedule Performance Index (SPI)	$SPI = EV / PV$	> 1 = ahead; < 1 = behind schedule
EAC (typical)	$EAC = BAC / CPI$	Current cost trend continues
EAC (atypical)	$EAC = AC + (BAC - EV)$	Past variances were one-time
EAC (composite)	$EAC = AC + (BAC - EV) / (CPI \times SPI)$	Both cost & schedule trends continue
Estimate to Complete (ETC)	$ETC = EAC - AC$	Cost of remaining work
Variance at Completion (VAC)	$VAC = BAC - EAC$	+ve = under budget; -ve = over budget
TCPI (against BAC)	$TCPI = (BAC - EV) / (BAC - AC)$	> 1 = must improve; < 1 = on track
TCPI (against EAC)	$TCPI = (BAC - EV) / (EAC - AC)$	> 1 = must improve; < 1 = achievable

Three-Point Estimating

Triangular Estimate	$E = (O + M + P) / 3$	Simple average
Beta (PERT) Estimate	$E = (O + 4M + P) / 6$	Weighted toward most likely
Standard Deviation	$\sigma = (P - O) / 6$	Single activity spread
Variance	$\sigma^2 = [(P - O) / 6]^2$	Combine activity uncertainties

Communication Channels

Communication Channels	$\text{Channels} = n(n - 1) / 2$	n = number of people
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Expected Monetary Value (EMV)

EMV	$EMV = \text{Probability} \times \text{Impact}$	Per risk; sum for total
Decision Tree	$\text{Value} = \Sigma(\text{Probability} \times \text{Outcome})$	Compare nodes for best option

Project Selection & Financial Metrics

Net Present Value (NPV)	$NPV = \Sigma[CF / (1 + r)^t]$	Higher NPV = better; select NPV > 0
Benefit-Cost Ratio (BCR)	$BCR = \text{Benefits} / \text{Costs}$	> 1 = viable; higher is better
Return on Investment (ROI)	$ROI = (\text{Net Profit} / \text{Cost}) \times 100\%$	Higher % = better return
Internal Rate of Return	IRR = rate where NPV = 0	Higher IRR = better investment
Payback Period	$\text{Payback} = \text{Investment} / \text{Annual CF}$	Shorter = faster recovery

Statistical Process Control

Upper Control Limit	$UCL = \mu + z\sigma$	z = 3 for 99.73% (3-sigma)
Lower Control Limit	$LCL = \mu - z\sigma$	Outside = special-cause variation

Point of Total Assumption (PTA)

PTA	$PTA = (\text{Ceiling} - \text{Target Price}) / \text{Buyer Share} + \text{Target Cost}$	FPIF contract risk threshold
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Cost Budgeting

Cost Baseline	$\text{Cost Baseline} = \Sigma \text{WP Estimates} + \text{Contingency Reserves}$	BAC = cost baseline; excludes mgmt reserves
Project Budget	$\text{Project Budget} = \text{Cost Baseline} + \text{Management Reserves}$	Total authorized budget
Crash Cost/Time	$\text{Crash Cost/Time} = (\text{Crash Cost} - \text{Normal Cost}) / (\text{Normal Time} - \text{Crash Time})$	Lower = better crashing candidate

Depreciation

Straight-Line Depreciation	$\text{Dep} = (\text{Asset Cost} - \text{Salvage}) / \text{Useful Life}$	Equal expense each period
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Agile Metrics

Velocity	$V = \text{Story Points} / \text{Sprint}$	Average 3+ sprints
Sprints Remaining	$\text{Sprints} = \text{Remaining SP} / \text{Avg Velocity}$	For release planning
Sprint Value	$\text{Sprint Value} = V \times \text{Cost per SP}$	Bridges agile to EVM

Quick Interpretation Rules for EVM

Variance = EV minus something	CV = EV - AC, SV = EV - PV. Positive is favorable.
Index = EV divided by something	CPI = EV / AC, SPI = EV / PV. > 1.0 is favorable.
TCPI > 1.0 = must improve	Remaining work must be done more efficiently.
EAC > BAC = budget overrun	VAC will be negative.
SV & SPI lose meaning at end	Both converge to 0 / 1.0 at completion.
CPI stabilizes at ~20% done	Reliable predictor after 20% of work complete.