PM Exam Formula Cheat Sheet by BrainBOK

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Earned Value Management (EVM)

Earned Value (EV)	`EV = % Complete × BAC`	Budgeted cost of work performed
Planned Value (PV)	`PV = Planned % Complete × 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 × 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	`σ = (P − O) / 6`	Single activity spread
Variance	`σ² = [(P − O) / 6]²`	Combine activity uncertainties

Communication Channels

Communication Channels	`Channels = n(n − 1) / 2`	n = number of people

Expected Monetary Value (EMV)

EMV	`EMV = Probability × Impact`	Per risk; sum for total
Decision Tree	`Value = Σ(Probability × Outcome)`	Compare nodes for best option

Project Selection & Financial Metrics

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

Statistical Process Control

Upper Control Limit	`UCL = μ + zσ`	z = 3 for 99.73% (3-sigma)
Lower Control Limit	`LCL = μ − zσ`	Outside = special-cause variation

Point of Total Assumption (PTA)

PTA	`PTA = (Ceiling − Target Price) / Buyer Share + Target Cost`	FPIF contract risk threshold

Cost Budgeting

Cost Baseline	`Cost Baseline = Σ WP Estimates + Contingency Reserves`	BAC = cost baseline; excludes mgmt reserves
Project Budget	`Project Budget = Cost Baseline + Management Reserves`	Total authorized budget
Crash Cost/Time	`Crash Cost/Time = (Crash Cost − Normal Cost) / (Normal Time − Crash Time)`	Lower = better crashing candidate

Depreciation

Straight-Line Depreciation	`Dep = (Asset Cost − Salvage) / Useful Life`	Equal expense each period

Agile Metrics

Velocity	`V = Story Points / Sprint`	Average 3+ sprints
Sprints Remaining	`Sprints = Remaining SP / Avg Velocity`	For release planning
Sprint Value	`Sprint Value = V × 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.