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Homogeneous Riemannian manifolds

Definition. A Riemannian manifold (M, g) is a **homogeneous Riemannian manifold** if $\text{Isom}(M, g)$ acts transitively on M .

These homogeneous Riemannian manifolds

- have constant *scalar* curvature

Homogeneous Riemannian manifolds are complete. >

Thus we have

•
$$\begin{aligned} G/K &\cong_G M \\ gK &\mapsto g(p) \end{aligned}$$

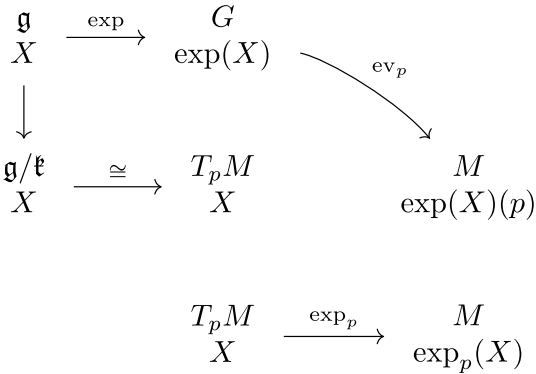
whose derivative at i gives

$$\mathfrak{g}/\mathfrak{k} \cong T_p M$$

- and we have the **exponential** map for geodesics

$$\exp_p : T_p M \rightarrow M$$

Therefore, have a diagram



where the two exponentials may **not** be the same!

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