**Activity 3.8.1: Applying Triangle Congruence in
Constructing Angle Bisectors and Perpendicular Lines**

Total points = 37

A. Answers
1. SAS Triangle Congruence Postulate ✓
2. $\overline{AY} \cong \overline{DY}$, ✓ $\overline{MY} \cong \overline{MY}$, ✓ $\overline{MA} \cong \overline{MD}$ ✓
3. $\angle A \cong \angle D$, ✓ $\angle YMA \cong \angle YMD$, ✓ $\angle MYA \cong \angle MYD$ ✓
4. $\angle MYA$ and $\angle MYD$, ✓ $\angle YMA$ and $\angle YMD$ ✓
5. $m\angle MYA = m\angle MYD$ ✓

$m\angle DYA = m\angle MYA + m\angle MYD$ ✓

$m\angle DYA = m\angle MYA + m\angle MYA$ ✓

$m\angle DYA = 2m\angle MYA$ ✓

$\dfrac{m\angle DYA}{2} = \dfrac{2m\angle MYA}{2}$ ✓

$\dfrac{1}{2}m\angle DYA = m\angle MYA$ ✓

$m\angle MYA = \dfrac{1}{2}m\angle DYA$ ✓

$m\angle YMA = m\angle YMD$ ✓

$m\angle DMA = m\angle YMA + m\angle YMD$ ✓

$m\angle DMA = m\angle YMA + m\angle YMA$ ✓

$m\angle DMA = 2m\angle YMA$ ✓

$\dfrac{m\angle DMA}{2} = \dfrac{2m\angle YMA}{2}$ ✓

$\dfrac{1}{2}m\angle DMA = m\angle YMA$ ✓

$m\angle YMA = \dfrac{1}{2}m\angle DMA$ ✓

6. $\overline{YM}$ bisects angles $\angle DYA$ and $\angle DMA$. ✓

B. Answers
1. HA Triangle Congruence Theorem ✓
2. $\overline{XA} \cong \overline{DX}$, ✓ $\overline{AY} \cong \overline{XC}$, ✓ $\overline{XY} \cong \overline{DC}$ ✓
3. $\angle A \cong \angle CXD$, ✓ $\angle AYX \cong \angle XCD$, ✓ $\angle AXY \cong \angle D$ ✓
4. $\angle AXY$ and $\angle DXC$ ✓
5. $m\angle A + m\angle AXY + m\angle AYX = 180°$ ✓

$m\angle CXD + m\angle AXY + m\angle AYX = 180°$ ✓

$m\angle CXD + m\angle AXY + 90° = 180°$ ✓

$m\angle CXD + m\angle AXY + 90° - 90° = 180° - 90°$ ✓

$m\angle CXD + m\angle AXY = 90°$ ✓

$\therefore \overline{AX} \perp \overline{DX}$