4. $\triangle IBC$ is isosceles of vertex I (Given)
then, $IB = IC = 6 - x$ (sides adjacent to main vertex of iso $\triangle$)
Apply pythagorean theorem in right $\triangle AIB$.

$$BI^2 = AB^2 + AI^2$$
$$(6-x)^2 = 4^2 + (x)^2$$
$$36 - 12x + x^2 = 16 + x^2$$
$$-12x = 16 - 36$$
$$-12x = -20$$
$$\therefore \boxed{x = \frac{5}{3}} \quad \text{Choice } \boxed{b}$$

5. $2a + \frac{5}{a} = 8$ (Given)

$$\left(2a + \frac{5}{a}\right)^2 = 8^2 \quad \text{(square both sides)}$$

$$4a^2 + 2(2a)\left(\frac{5}{a}\right) + \frac{25}{a^2} = 64.$$

$$4a^2 + 20 + \frac{25}{a^2} = 64$$

$$\therefore 4a^2 + \frac{25}{a^2} = 44 \quad \text{Choice } \boxed{c}$$

6. $-5^2 - 3^2 - 7^2 = -25 - 9 - 49$
$= -25 - 58$
$= -83$ Choice $\boxed{b}$