1. x = none, $y = a^m$, $z = b^m$

We should be able to pump y as much as we want, and the string should still be accepted.

Assume $m = 8$, then $xyz = a^8b^8$, this is an accepted string. Therefore xy^2z should also be accepted, however, $xy^2z = a^{16}b^8$, this is not an accepted string. Therefore this language is not regular.

2. x = none, $y = (a + b)^*$, z = none

We should be able to pump y as much as we want, and the string should still be accepted.

Assume $n_a = 1$, and $n_b = 2$ then $xyz = abb \mid bab \mid bba$, this is an accepted string. Therefore xy^2z should also be accepted, however, $xy^2z = abbabb \mid babbab \mid bbabba$, this is not an accepted string because the $n_a = 1$, and $n_b = 2$ no longer holds true. Therefore this language is not regular.

3. x = none, $y = a^m$, $z = b^n$

We should be able to pump y as much as we want, and the string should still be accepted.

Assume $m = 2$, $n = 1$ then $xyz = aab$, this is an accepted string. Therefore pumping y down should also be accepted, however, $xz = b$, this is not an accepted string because 0 / 1 is not a positive integer. Therefore this language is not regular.

4. x = none, $y = a^{2^n}$, z = none

We should be able to pump y as much as we want, and the string should still be accepted.

Assume $n = 1$ then $xyz = aa$, this is an accepted string. Therefore xy^3z should also be accepted, however, $xy^3z = aaaaaa$, this is not an accepted string. Therefore this language is not regular.