

Name: _____

(1) Tell whether the given strings match the given regular expressions. No explanation necessary or useful.

<i>matches</i>	<i>does not match</i>		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>aaba</i>	$a^* + b^*$ (As a^*b^* contains only words with only a's or b's not both)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>abbbb</i>	$(\varepsilon + a)^*b^*$ (Using one a from $(\varepsilon + a)^*$)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>abb</i>	$b^* + (a + b)^*b$
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>babab</i>	$b(ab)^*$
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>abb</i>	$(a + b)(a + b)^*a(a + b)^*$ (As words here must have an a after the first letter.)

(2) Write a regular expression for the following sets over the alphabet $\Sigma = \{a, b\}$. No explanation necessary or useful. There are many correct ways to do this. I give a few for each.

(a) All strings whose 7th letter is b.

$$(a + b)^6b(a + b)^*$$

(b) All strings containing at least one a.

$$(a + b)^*a(a + b)^* \text{ or } b^*a(a + b)^*$$

(c) All strings containing at least one a or at least two b.

$$(a + b)^*a(a + b)^* + (a + b)^*b(a + b)^*b(a + b)^* \text{ or } b^*a(a + b)^* + bbb^*$$