Problem 1:

(a)
Problem 2:

(a) \(\sqrt{4} + 5\)

- type: \(\text{Floating } a \Rightarrow a\)
- result: 7.0

explain: Since function application has the highest priority, the expression will be evaluated as \((\sqrt{4}) + 5\).
(b) 'a': 'b': []

type: [Char]
result: "ab"
explain: 'a':('b':[]), : right associative. The type [Char] == String.

(c) \((2^3)\)

type: Num a
result: 6
explain: \(2^3\), * is an infix operator, \(2^3\) is partial function application.

(d) \([(*),(+)]\)

type: [Integer -> Integer -> Integer]
result: ERROR - Cannot find "show" function for Expression : \([(*),(+)]\)
explain: (*) and (+) are the representation for the infix operator * and +.
The expression is a list of type: Integer -> Integer -> Integer functions.

(e) \(\text{fst ((<),(/)) 3 5}\)

type: (Num a, Ord a, Fractional b) => Bool
result: True
explain: \(\text{fst is a function with type (a,b)-> a. So }\text{fst ((<),(/)) 3 5}
\text{evaluates to (fst ((<),(/)) 3 5 ) 3 5 } \Rightarrow \text{ (<) 3 5. Since (<) is an infix operator}
\text{with type of: Ord a => a -> a -> Bool, the value of the expression is 'True'
because 3<5.}

Problem 3:

\(\text{pal [] = True} \quad \text{-- empty list is a palindrome}\)
\(\text{pal (y:[] ) = True} \quad \text{-- list with one item is a palindrome}\)
\(\text{pal (x:xs) = x==last xs &\& pal (init xs) -- check first and last}\)
\(\quad \quad \text{-- item same, remove them and test rest}\)

Problem 4:

\(\text{isVowel x | elem x "aeiou" = True}\)
\(\quad \text{| otherwise = False}\)