

TEACHING ASSISTANT

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INSTRUCTIONS

- Do not start this quiz until you are told to do so.
- You have 15 minutes for this quiz.
- This is a closed book quiz. No notes or other aids are allowed.
- For partial credit, show all your work and clearly indicate your answers.

1. [8 pts] Give the type of the following OCaml expression. If there is a type error, write "error" and briefly explain why.

(a) `"one"::[2;3]`

`error: lists are homogeneous`

(b) `let z = 7 in ("z", z)`

`string * int`

(c) `fun x y -> if x > y then (x,y) else (y,x)`

`'a -> 'a -> 'a * 'a`

(d) `fun g a b -> a::(g b)`

`('a -> 'b list) -> 'b -> 'a -> 'b list`

2. [6 pts] Give an OCaml expression of the following type without using type annotations.

(a) `int -> int -> int`

Possible solutions:

`(+)`

`fun a b -> a + b`

(b) `'a -> 'b -> 'b * 'a list`

Possible solutions:

`fun a b -> b, [a]`

`fun a b -> b, (a :: [])`

(c) `(string -> string) -> string`

Possible solution:

`fun x -> (x "") ^ ""`

3. [6 pts] What is the value of the following OCaml expression?

```
(a) let x = 5 in
    let y = 4 in
    let x = 3 in
    (if x < y then x * y else x / y)
```

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```
(b) let rec f1 l c = match l with
    | [] -> c
    | h::t -> (h*c) + (f1 t (c-1))
in f1 [1;2;3;4] 5
```

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