

York U., CSE Dept., midterm test (MT), CSE/MATH 1560, W12

- This is a closed book, 45 minutes test
- The weight of Exercise 2 is twice the weight of Exercise 1. (for grading purposes)
- **If in doubt for some of the exercises, please write down your doubts and assumptions and continue with your answer.**

Last name	SOLUTIONS
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!!! Use proper indentation and formatting in your code !!!

Exercise 1 Write a procedure P1 to calculate $\sqrt{x^x}$. The procedure should compute $\sqrt{x^x}$ only if it is computable, i.e., only if $x^x \geq 0$ (you should check for this case in your code). In any other case, the procedure should avoid proceeding with the calculation and, instead, should print a message that reveals why it did not proceed with the calculation (e.g. the message could read something like “*x ^ x is negative, result not computed*”). Your procedure should have only one parameter (named X), and should return the result of the calculation using ‘return’.

Answer:

```
P1 := proc ( X)
  IF ( x ^ x >= 0 ) then
    RETURN ( sqrt( x ^ x ) );
  ELSE
    PRINT ( “x ^ x is negative, result not computed” );
  END IF;
END PROC;
```

Exercise 2 Write a procedure P2, to calculate $\sqrt{X^{\sin(x)}}$. P2 calls (inside its body) another procedure P3 that computes $X^{\sin(x)}$ and then uses the returned value of P3 to compute the square root (i.e., to compute $\sqrt{X^{\sin(x)}}$). You should write both procedures P2 and P3. For P2, similar conditions that were described for P1 of exercise 1, apply (i.e., P2 should check if $X^{\sin(x)} \geq 0$ and print appropriate message if it is not; no need to check if $\sin(x)$ itself is computable). Procedure P3 should return the calculated result using 'return'.

Answer:

```
P2 := proc ( X )
```

```
    IF ( x ^ sin(x) >= 0 ) THEN
        RETURN ( sqrt ( P3 ( X ) ) );
    END IF;
```

```
END PROC ; ## end P2
```

```
P3 := proc ( x )
```

```
    IF ( x ^ sin( x ) >= 0 ) THEN
        RETURN ( x ^ sin( x ) ) ;
    ELSE
        PRINT ( " x ^ sin( x ) is negative " );
    END IF ;
```

```
END PROC; ## end P3
```