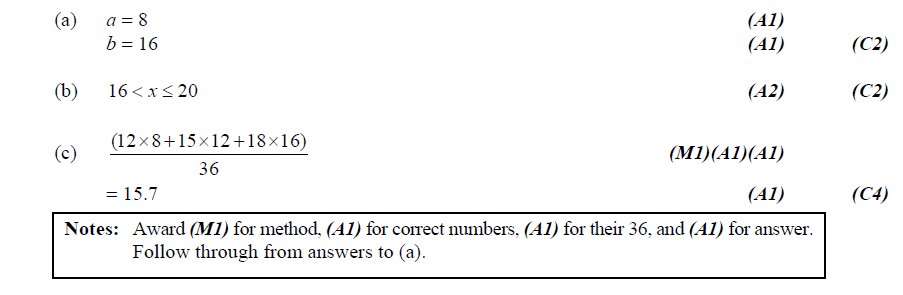
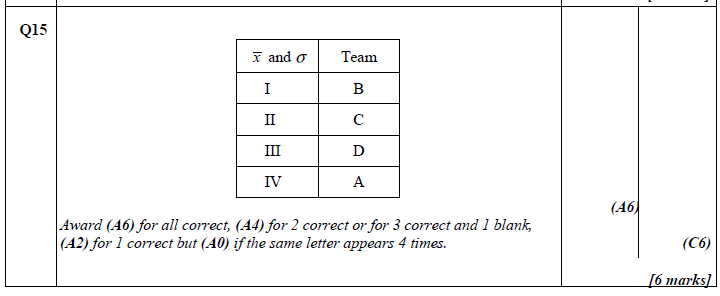
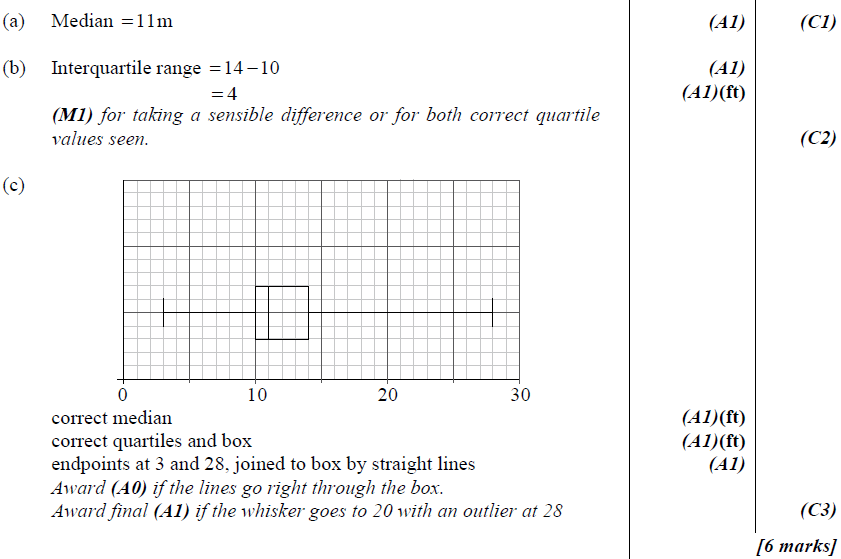
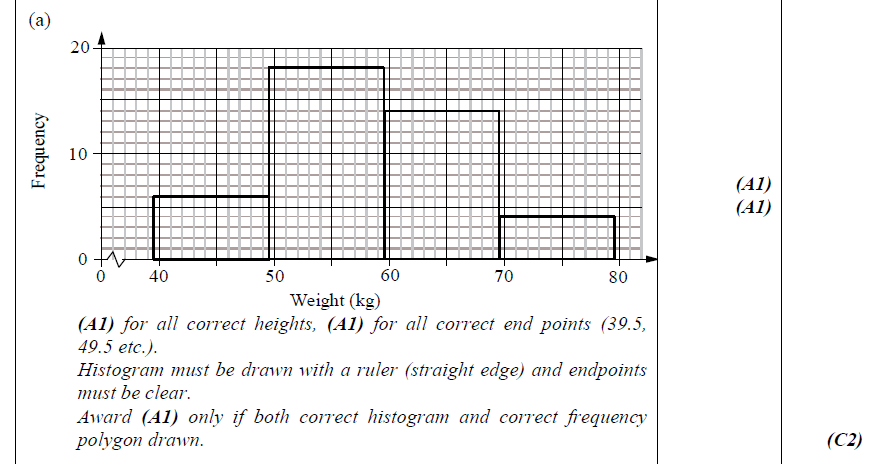
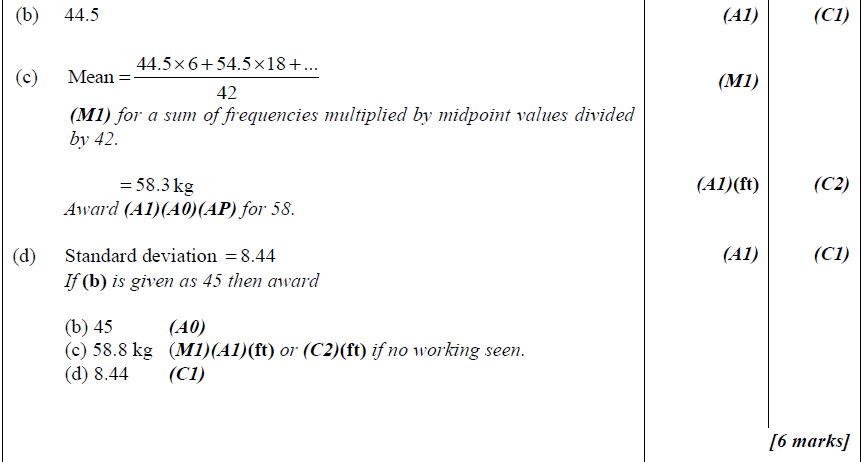
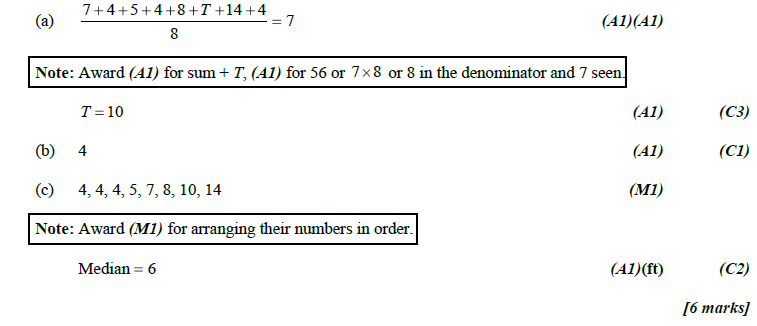
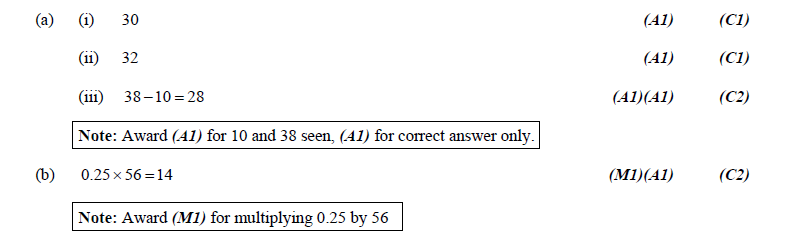
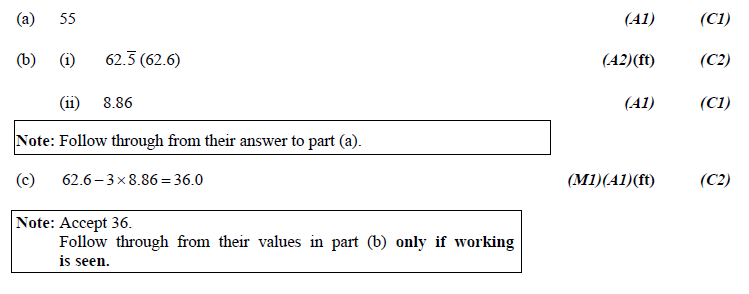
PreDP Sample Test L10IS10 Unit 1 Sept 2017 – Mark scheme

1. 
2. 
3. 
4.  
5. 
6. 
7. 
8. (a)   
   ;   
   where there are *fi*of *xi* for *i*=1, 2, 3, …, *n*. M1 A1  
   Note: M1 for an attempt to use the definition of sample mean.   
    A1

AG

(b)   
 M1

A1  
Var( *X + a*) = M1

Var( *X + a*) = A1  
Var( *X + a*) =   
 Var( *X + a*) = Var(*X*) AG

(c) M1  
   
 A1

Var(*bX*) = M1

Var(*bX*) = 2

Var(*bX*) = A1

Var(*bX*) =

Var(*bX*) =Var(*X*) AG

1. Proof by Contradiction   
   Let *n* be a positive integer, *P*= and *P* is rational. M1  
   Since *P*= then *P* -

*n* = (*P* - )2  M1

*n = P2 – 2P+ 2* A1

*2P = P2 + 2 – n ------------------------------------------- (1)*  A1From (1) it can be infer that *P* is a non-zero rational.

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(2)*  A1Since *P2 + 2 – n* are rational and 2*P* are rational then the RHS in (2) is rational.   
(2) implies that is rational. R1  
This is a contradiction.

Hence, by the proof by contradiction, *P*= is irrational.