**Self-assessment answers: 7 Sequences and series**

**1.** (a) *u*15 = 3 + 14 × 0.7 = 12.8 *[1 mark]*

(b) *u*10 = 10 × 1.29 = 51.6 (3SF) *[1 mark]*

(c) *S*20 = (2 × 1 + 19(−2.4)) = −436 *[1 mark]*

(d) *S*∞ =  = 105 *[1 mark]*

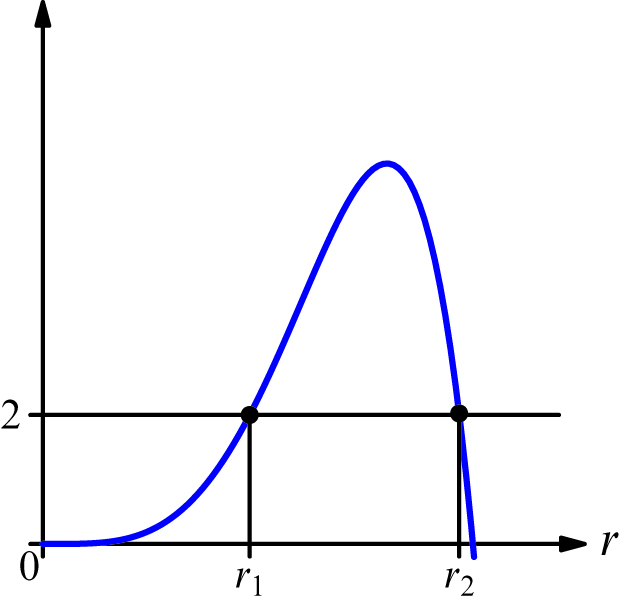
**2. **

⇒ *a* = 44.5, *d* = –3.5 *[4 marks]*

**3.** 

*a* = 72(1 – *r*)

72(1 – *r*)*r* 4 = 2



⇒ *r* = 0.481 or 0.968 (from GDC) *[5 marks]*

**4.** (2*x* + 3) – (*x* – 1) = (*x*2 – 3) – (2*x* + 3)

⇔ *x*2 – 3*x* – 10 = 0

⇔ (*x* – 5)(*x* + 2) = 0

∴ *x* = 5 or −2*[4 marks]*

**5.** (a) Arithmetic sequence, *u*1 = 10, *d* = 2 *[1 mark]*

(i) *u*8 = 10 + 7 × 2 = £24*[1 mark]*

(ii) *S*8 = (20 + 7(2)) = £136 *[1 mark]*

(iii) *Sn* = (20 + 2(*n* – 1)) = (2*n* + 18)

Using table (or graph) on GDC: *Sn* > 200 after 11 months*[3 marks]*

(b) 1st month: 10

2nd month: 10 × 1.01 + 10

3rd month: (10 × 1.01 + 10) × 1.01 + 10 = 10 × 1.012 + 10 × 1.01 + 10

Geometric series, *u*1 = 10, *r* = 1.01 *[2 marks]*

(i) *S*10 =  = £104.62 *[1 mark]*

(ii) *Sn* = 

*Sn* > 200 after 19 months*[2 marks]*

(c) Freya: *Fn* = 

Caroline: *Cn* = (2*n* + 18)

Using table (or graph) on GDC: *Fn* > *Cn* after 590 months *[3 marks]*