**Unit 9 Review Answer Key**

**1.** *S*5 = {2 + 32} (M1)(A1)(A1)
*S*5 = 85 (A1)**OR***a* = 2, *a* + 4*d* = 32(M1)
 4*d* = 30
 *d* = 7.5 (A1)
*S*5 = (4 + 4(7.5)) (M1)
= (4 + 30)
*S*5 = 85 (A1) (C4)

[4]

**2.** (a) Plan A: 1000, 1080, 1160... Plan B: 1000, 1000(1.06), 1000(1.06)2…
2nd month: $1060, 3rd month: $1123.60 (A1)(A1) 2

(b) For Plan A, T12 = *a* + 11*d*
 = 1000 + 11(80) (M1)
 = $1880 (A1)

 For Plan B, T12 = 1000(1.06)11 (M1)
 = $1898 (to the nearest dollar) (A1) 4

(c) (i) For Plan A, S12 = [2000 + 11(80)] (M1)
 = 6(2880)
 = $17280 (to the nearest dollar) (A1)

(ii) For Plan B, S12 =  (M1)
 = $16870 (to the nearest dollar) (A1) 4

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**3.** (a) *r* =  = 1.5 (A1) 1

(b) 2002 is the 13th year. (M1)
*u*13 = 160(1.5)13–1 (M1)
= 20759 (Accept 20760 or 20800.) (A1) 3

(c) 5000 = 160(1.5)*n*–1
 = (1.5)*n*–1(M1)
log = (*n* – 1)log1.5 (M1)
*n* – 1 =  = 8.49 (A1)
 *n* = 9.49  10th year
  1999 (A1)

 **OR**

 Using a gdc with *u*1 = 160, *uk*+1 = *uk*, *u*9 = 4100, *u*10 = 6150 (M2)
1999 (G2) 4

(d) *S*13 = 160 (M1)
= 61958 (Accept 61960 or 62000.) (A1) 2

(e) Nearly everyone would have bought a portable telephone so there
would be fewer people left wanting to buy one. (R1)

 **OR**

 Sales would saturate. (R1) 1

[11]

**4.** (a) (i) PQ =  (M1)
 =  =  = 2 cm (A1)(AG)

(ii) Area of PQRS = (2)(2) = 8 cm2 (A1) 3

(b) (i) Side of third square = = 4 = 2 cm
Area of third square = 4 cm2 (A1)

(ii)  (M1)
 Geometric progression, *r* =  (A1) 3

(c) (i) *u*11 = *u*1*r*10 = 16=  (M1)
 = ( = 0.015625 = 0.0156, 3 sf) (A1)

(ii) *S* =  =  (M1)
 = 32 (A1) 4

[10]

**5.** (a)  (0.2) A1 N1

(b) (i)  (M1)

 = 0.0000128  A1 N2

(ii)  A1 N1

(c) For attempting to use infinite sum formula for a GP  (M1)

*S* =  A1 N2

[6]

**6.** (a) (i) Area B = , area C =  (A1)(A1)

(ii)  (Ratio is the same.) (M1)(R1)

(iii) Common ratio =  (A1) 5

(b) (i) Total area (*S*2) =  = (= 0.3125) (0.313, 3 sf) (A1)

(ii) Required area = *S*8 =  (M1)
 = 0.333328 2(471...) (A1)
 = 0.333328 (6 sf) (A1) 4

**Note:** Accept result of adding together eight areas correctly.

(c) Sum to infinity =  (A1)
 =  (A1) 2

[11]

**7.** (a) (i) Neither

(ii) Geometric series

(iii) Arithmetic series

(iv) Neither (C3)

**Note:** Award (A1) for geometric correct, (A1) for arithmetic correct and (A1) for **both** “neither”. These may be implied by blanks **only** if GP **and** AP correct.

(b) (Series (ii) is a GP with a sum to infinity)
Common ratio  (A1)
*S*∞ =  (M1)
= 4 (A1) (C3)

**Note:** Do **not** allow **ft** from an incorrect series.

[6]

**8.** (a) (i) *r* = 2 A1 N1

(ii) *u*15 = 3 (2)14 (A1)

 = 49152 (accept 49200) A1 N2

(b) (i) 2, 6, 18 A1 N1

(ii) *r* = 3 A1 N1

(c) Setting up equation (or a sketch) M1

 (or correct sketch with relevant information) A1

*x*2 + 2*x* + 1 = 2*x*2 + 2*x*  24 (A1)

 *x*2 = 25

*x* = 5 or *x* = 5

 *x* = 5 A1 N2

**Notes**: If “trial and error” is used, work must be
 documented with several trials shown.
 Award full marks for a correct answer with this
 approach.
 If the work is **not** documented, award N2 for a
 correct answer.

(d) (i) *r* =  A1 N1

(ii) For attempting to use infinite sum formula for a GP (M1)

S = 

S = 16 A1 N2

**Note:** Award M0A0 if candidates use a value of r
 where r > 1, or r < 1.

[12]

**9.** For using *u*3 = *u*1*r*2 = 8 (M1)

 8 = 18*r*2 (A1)

*r2* = 

 *r* =  (A1)(A1)

**

** (A1)(A1) (C3)(C3)

[6]