

Final Review Answers

#1. $x = r \cos \theta = 5 \cos 30^\circ = 4.33$

$y = r \sin \theta = 2.5$

Answer \Rightarrow D

#2 substitute in!

A. $t_2 = 2 + 2(t_{2-1} + 1)$
 $= 2 + 2(6 + 1)$
 $= 2 + 2(7)$
 $= 16$ X

B. $t_2 = (t_{2-1} + 1) / (2 - 2)$
 $= (t_1 + 1) / 0 = 0$ X

C. $t_2 = 2(t_{2-1} + 2) - (2 + 2)$
 $= 2(t_1 + 2) - (2 + 2)$
 $= 2(6 + 2) - 4$
 $= 2(8) - 4$
 $= 16 - 4 = 12$

$t_3 = 2(t_{3-1} + 2) - (3 + 2)$
 $= 2(t_2 + 2) - 5$
 $= 2(12 + 2) - 5$
 $= 2(14) - 5 \neq 20$ X

so D

#8  (r, θ)

$4^2 + 9^2 = 97$

$r = \sqrt{97}$ & has to be in first quadrant \Rightarrow A

#9 $S_n = \frac{a_1(1-r^n)}{1-r}$

$3280 = \frac{1(1-3^n)}{1-3} = \frac{(1-3^n)}{-2}$

$-6560 = 1-3^n$

$-6561 = -3^n$

$\log_3 6561 = 8 \rightarrow$ C

#10 $S = \frac{a_1}{1-r} \Rightarrow 6 = \frac{2}{1-r}$

$6 - 6r = 2$

$-6r = -4$

$r = 2/3 \rightarrow$ B

#11 $r = \frac{3}{4} \rightarrow$ converges

$S = \frac{a_1}{1-r} = \frac{\pi}{1-3/4} = \frac{\pi}{1/4}$

$= \pi \cdot 4/1 \rightarrow 4\pi \rightarrow$ D

#12 $a_5 = a_4 + 3(5) - 1$

$a_5 = 407 = a_4 + 14$

$a_4 = 393 \rightarrow$ repeat!

$393 = a_3 + 3(4) - 1$

$a_3 = 382$

$382 = a_2 + 3(3) - 1$

$a_2 = 374$

$374 = a_1 + 3(2) - 1$

$369 = a_1 \rightarrow$ D

#19 graph it! ~~is~~ hyperbola! C

Unit 7 and 8 Review Answers

1. $a_n = -3a_{n-1} + n$ and $a_3 = 12$

$$a_4 = -3a_{4-1} + 4 \quad a_3 = -3a_{3-1} + 3$$

$$a_4 = -3a_3 + 4 \quad 12 = -3a_2 + 3$$

$$a_4 = -3(12) + 4 \quad 9 = -3a_2$$

$$a_4 = \boxed{-32} \quad \boxed{a_2 = -3}$$

3. $\sum_{n=1}^{\infty} 4\left(\frac{1}{4}\right)^{n-1} = 4 + 1 + \frac{1}{4} + \dots$

$$S = \frac{a_1}{1-r} = \frac{4}{1-\frac{1}{4}} =$$

$$\frac{4}{\frac{3}{4}} = 4 \cdot \frac{4}{3} = \boxed{\frac{16}{3}}$$

or $\boxed{5.\bar{3}}$

5. $S_n = \frac{4(1-(-3)^n)}{1-(-3)} = \frac{4(1-(-3)^n)}{4}$

$$S_n = 1 - (-3)^{\frac{n}{2}}$$

$$2188 = 1 - (-3)^{\frac{n}{2}}$$

$$2187 = -(-3)^{\frac{n}{2}}$$

$$2187 = 3^n$$

$$\log_3 2187 = \boxed{n = 7}$$

2. $a_{50} = a_1 + d(n-1)$

$$a_{50} = -7 + 6(50-1)$$

$$\boxed{a_{50} = 287}$$

4. $\frac{28}{12^{th}}, \dots, \frac{64}{18^{th}}$

12 to 18 = 6 terms

$$28 + 6d = 64$$

$$6d = 36 \rightarrow d = 6$$

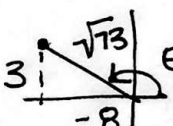
$$a_{12} = a_1 + 6(12-1)$$

$$28 = a_1 + 66$$

$$a_1 = -38$$

$$a_{123} = -38 + 6(123-1)$$

$$= \boxed{694}$$

6.  $(r, \theta) = \boxed{(\sqrt{73}, 159.44^\circ)}$

$$3^2 + (-8)^2 = r^2$$

$$9 + 64 = r^2$$

$$73 = r^2$$

$$\tan \chi = \frac{3}{8}$$

$$\chi = \tan^{-1}\left(\frac{3}{8}\right)$$

$$\chi = 20.55^\circ$$

$$180^\circ - 20.55^\circ$$

7. $x = r \cos \theta = 10 \cos 134^\circ = -6.95$

$$y = r \sin \theta = 10 \sin 134^\circ = 7.19$$

$$\boxed{(-6.95, 7.19)}$$

8. $r \cdot r = 8 \cos \theta + 2 \sin \theta \cdot r$

$$r^2 = 8r \cos \theta + 2r \sin \theta$$

$$\boxed{x^2 + y^2 = 8x + 2y \rightarrow \text{circle!}}$$

9. $x = 3t + 2$
 $x - 2 = 3t$

$$\frac{x-2}{3} = t$$

$$y = 27 \left(\frac{x-2}{3}\right)^3 - 18$$

$$y = \frac{27}{27} \frac{(x-2)^3}{27} - 18$$

$$\boxed{y = (x-2)^3 - 18 \text{ cubic!}}$$