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1. a)  $a=8$   $r=\frac{1}{2}$

$$8 \times \left(\frac{1}{2}\right)^{n-1} = \frac{1}{128}$$

$$\left(\frac{1}{2}\right)^{n-1} = \frac{1}{1024} = \left(\frac{1}{2}\right)^{10}$$

$n-1=10$   $n=11$

$$S_n = \frac{8(1-\left(\frac{1}{2}\right)^{11})}{1-\frac{1}{2}}$$

$$S_n = \frac{2047}{128}$$

b)  $a=3$   $r=2$

$$3 \times 2^{n-1} = 3072$$

$$2^{n-1} = 1024 = 2^{10}$$

$n-1=10$   $n=11$

$$S_n = \frac{3(1-2^{11})}{1-2}$$

$$S_n = 6141$$

c)  $S_n = 870.62446$

d)  $S_n = \frac{1365}{8}$

e)  $S_n = 135.10725$

f)  $S_n = 1.230705$

2. a)  $\frac{81}{2}$  b) 20 c)  $\frac{13}{30}$  d) 43 e) 149.961328 f)  $\infty$

3. 15

4. -12

5.  $\frac{28}{12}$

6.  $\frac{6561}{8192}$

7. 8.1349m

$\frac{326}{37}$  m

8. -21952

9. 600 000 barrels

10. 324

11. 25 years

12.  $S_{n+1} - S_n = t_n = ar^{n-1}$

13.  $a+ar=4$   
 $ar^2+ar^3=36$

$\frac{ar^2(1+r)}{r(1+r)} = \frac{36}{4}$   
 $r^2=9$   
 $r=\pm 3$

$r=3$

$a=1$

$S_9 = \frac{a(1-r^9)}{1-r}$   
 $= 3280$

$r=-3$

$a=-2$

$S_9 = 3280$

Ans. 3280

14.  $S_n = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots + \frac{1}{2^{n-1}}$

$\frac{1}{2}S_n = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots + \frac{1}{2^{n-1}} + \frac{1}{2^n}$

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

$S_n = 2 - \frac{1}{2^{n-1}} < 2$

#4)  $F = I \times N^{\frac{A}{L}}$

$L = 20 \text{ minutes}$

$N = 2$

$A = 8:30 \text{ am} - 7 \text{ pm}$   
 $= 6:30 \text{ min}$

$F = 1 \times (2)^{\frac{6:30}{20}}$

$F = \sqrt{2^3}$

8:30 9:30 10:30 11:30 12:30 1:30 2:30 3:30 4:30 5:30 6:30 7:30

12 H.  $8:30 - 9:00$   
 $= 30$   
 $21$

$12(60) - 30(24)$   
 $= 600 - 720$   
 $= -120$

$\frac{60}{11}$   
 $\frac{600}{60}$   
 $\frac{60}{60}$

(7 3)

2.3

$$\frac{x-2}{3} < 1$$

$$-1 < \frac{x-2}{3}$$

$$x-2 < 3$$

$$-3 < x-2$$

$$x < 5$$

$$-1 < x$$

so  $-1 < x < 5$