

## 6.2 Modeling Using Sequences

A forest of 7000 trees is being placed under a new forestry management plan. each year 25% of the trees will be harvested and 1500 new trees will be planted.

a) Write a recursive equation for this situation

$$u(n) = 0.75 \times u(n-1) + 1500$$

b) describe the growth of the forest over time. Will the forest size ever stabilize?

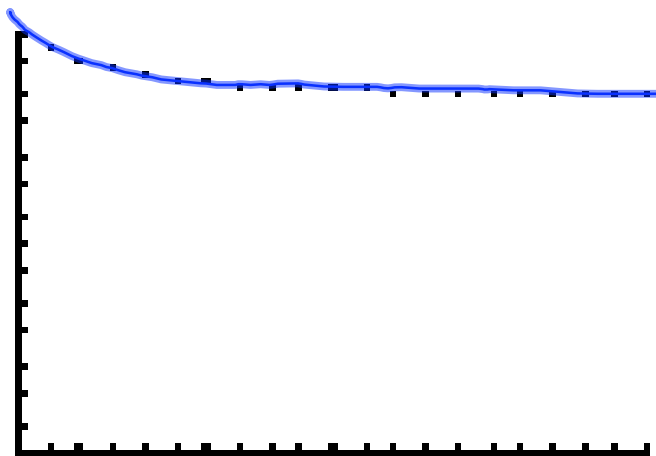
```

Plot1 Plot2 Plot3
nMin=0
u(n)=0.75*u(n-1)
)+1500
u(nMin)=7000
u(n)=
u(nMin)=
w(n)=

```

# of trees is decreasing

yes at 6000 trees in yr 25.



Assume that 10 units of insulin are injected into a person's bloodstream. Also assume that of the insulin present at the beginning of the minute only 95% of that amount remains at the end of that minute.

a) Write a recursive rule for this situation.

$$u(n) = 0.95 * u(n-1)$$

b) What is the approximate half life of insulin?

Between 13 and 14 min.

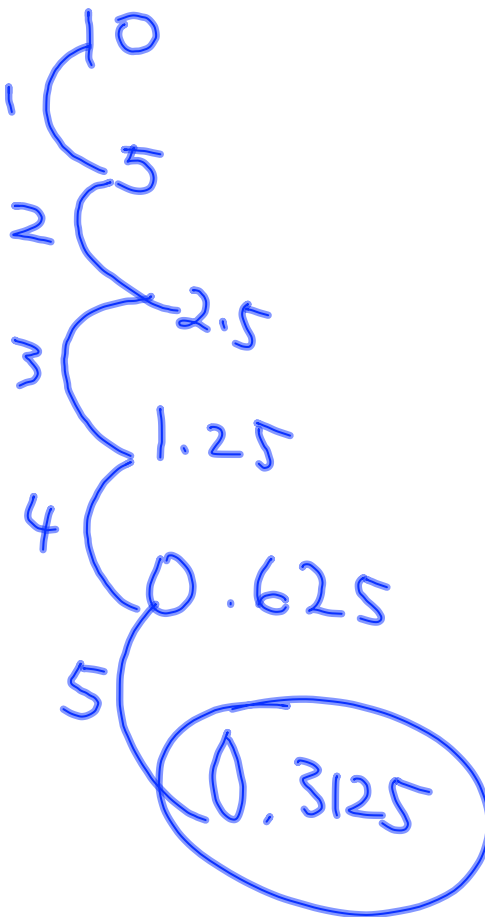
Time to arrive at half of the original amount

c) A rule that pharmacists use is that a drug has effectively disappeared from a person's system after 5 half-lives. Approximately how many minutes is it before this dose of insulin has effectively disappeared?

Between 67 and 68 min.

```

Plot1 Plot2 Plot3
nMin=0
u(n)=0.95*u(n-1)
)
u(nMin)=10
v(n)=
v(nMin)=
w(n)=
    
```



A veterinarian prescribes a 26 mg pill to be taken by a dog every morning. Twenty percent of the medication is eliminated from the dog's body everyday.

$$u(n) = 0.80 * u(n-1) + 26$$

a) Graph the level of medication in an average dog's bloodstream for 40 doses of this medication.

$$\underline{129.99 \text{ mg}}$$

b) Assume that the dog continues to receive one pill every day. How many days does it take before the level of the medication reaches its maintenance level?

Stabilize

45 doses

Pg. 270

1-5