

Business Area Highrise (BAH)

Geometric

-window \$120 per window

$$120 \times 24 = \$2880$$

$$r = 1.05$$

-inside \$102 per window

$$102 \times 8 = \$816$$

Industrial Area (IAH)

Arithmetic

-window \$103 per window

$$103 \times 28 = \$2884$$

$$3 \times 28 = 84$$

$$d = 84$$

-inside \$65 per window

$$65 \times 16 = \$1040$$

$$\text{BAH} \quad \frac{2880(1-1.05^n)}{(1-1.05)} + 816n$$

$$n = 15 = \$74386.26 \text{ (2 decimal places)}$$

①

$$\text{IAH} \quad \frac{n}{2}(2 \times 2884 + (n-1) \times 84) + (1040 \times n) \quad n = 15 = \$67680$$

②

Found the sums of each building weekly rent if they both had 15 floors. They are quite close in number but BAH is geometric so its size will get bigger quicker than IAH which is arithmetic.

$$\text{BAH} \quad n = 20 = 111549.95 \text{ (2 decimal places)}$$

$$n = 22 = 128847 \text{ (6sf)}$$

$$n = 23 = 138087.8 \text{ (1 decimal place)}$$

$$\text{IAH} \quad n = 30 = 154260$$

$$n = 25 = 123300$$

$$n = 26 = 129324$$

$$\text{IAH} = 26 = \$129324$$

$$\text{BAH} = 22 = \$128847$$

③

Because IAH has a much bigger floor level amount range and through guess and check I have discovered it can be a much higher number.

So I took the biggest floor amount (BAH) and got the sum and found could IAH not match it by less than 1000. So I dropped BAH by one floor and found I could match it.

I suggest IAH should have 26 floors and BAH should have 22 floors. It is the most money that can be made weekly with them less than 1000 apart.