

A sequence is defined by the recurrence relation $u_{n+1} = \frac{1}{2}u_n + k$, $u_0 = k$.

Find an expression for u_2 in terms of k .

- A. $\frac{3}{4}k$
- B. $\frac{3}{2}k$
- C. $\frac{7}{4}k$
- D. $\frac{5}{2}k$

Solution

$$u_1 = \frac{1}{2}k + k = \frac{3}{2}k$$

$$u_2 = \frac{1}{2} \times \frac{3}{2}k + k = \frac{3}{4}k + k = \frac{7}{4}k.$$

Option C

Pre-testing statistics

- Facility: 55%
- Discrimination: 0.69

A word about pre-testing...

Every question in our bank was tested with real Higher pupils – this allowed us to gather useful statistics for each question.

- The **facility** is the proportion of pupils who answered correctly – this gives an indication of how difficult your pupils should find the question.

Most of our questions have facilities between 30% and 80%.

- The **discrimination** indicates how well a question discerns between pupils of different abilities, with a range of -1 to 1 . As the discrimination approaches 1 , only the more able pupils tend to answer correctly.

The line with equation $y = ax + 4$ is perpendicular to the line with equation $3x + y + 1 = 0$.

What is the value of a ?

- A. 3
- B. $\frac{1}{3}$
- C. $-\frac{1}{3}$
- D. -3

Solution

$y = ax + 4$ has gradient a .

$$3x + y = -1$$

$$y = -3x - 1$$

So $m = -3$ and $m_1 = \frac{1}{3}$
since $m \times m_1 = -1$

$$\therefore a = \frac{1}{3}$$

Option B

Pre-testing statistics

- Facility: 70%
- Discrimination: 0.62