

Answer Key

Challenge: Decimals, Percentages, and Fractions

Q1. (a) $0.125 = \frac{1}{8} = 12.5\%$.

(b) $0.203125 = \frac{13}{64} = 20.3125\%$.

Q2. (a) $\frac{7}{20} = 0.35 = 35\%$.

(b) $\frac{33}{320} = 0.103125 = 10.3125\%$.

Q3. (a) $17.5\% = 0.175 = \frac{7}{40}$.

(b) $57.8125\% = 0.578125 = \frac{37}{64}$.

Q4. Basis points.

(a) $1 \text{ bp} = 0.01\% = 0.0001 = \frac{1}{10000}$.

(b) $175 \text{ bp} = 1.75\% = 0.0175 = \frac{7}{400}$.

Gilts.

(c) $5.678\% = 0.05678 = \frac{2839}{50000}$.

(d) Annual coupon is 56.78; coupons total $30(56.78) = 1703.40$; including repayment, total cost is £2703.40.

(e) $43.5 \text{ bp} = 0.435\% = 0.00435$; the coupon rises by £4.35 per year, so the extra cost is $30(4.35) = £130.50$.

(f) Compounding can be achieved by reinvesting every coupon payment and maturing principal in further gilts as soon as they are received, so interest is earned on previous interest.

Q5. (a) Upward-sloping, since

$$4.377\% < 4.474\% < 4.488\% < 4.492\% < 4.544\%.$$

- (b) The 5-year gilt has the highest yield, so it gives the best simple return if held to maturity and is the best starting point for a reinvestment strategy.
- (c) Use a coupon-reinvestment ladder: start with the 5-year gilt and each year reinvest all coupon cash received at the previous year-end in the longest-dated gilt that still matures by the end of Year 4.
- (d) Using that ladder, the final value is £12,484.60.

Gilt	Maturity payment
5-year	10454.40
4-year	474.81
3-year	496.11
2-year	518.30
1-year	540.98

$$10454.40 + 474.81 + 496.11 + 518.30 + 540.98 = 12484.60.$$

- (e) Annual simple rate: $r_s = 0.049692 = 4.9692\%$.
- (f) Annual compound rate: $r_c \approx 0.045382 = 4.538\%$.
- (g) Monthly rate: $r_m \approx 0.003705 = 0.3705\%$.