

Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

2.1 A – Two of five equal parts gives $45 \cdot 2/5 = 18$. B uses two thirds of the total rather than two fifths; C assumes equal shares despite the 2:3 ratio.

Correct response linked to the given case.

2.2 A – The change 20 is divided by original 80. B divides by final price; C is final price as a percentage of original, not percentage increase.

Correct response linked to the given case.

2.3 10 – $36 \cdot 1000/3600 = 10$.

Correct response linked to the given case.

2.4 False – The nonzero intercept prevents y/x being constant.

Correct response linked to the given case.

3.1 There are 11 parts, so each is 3 L. Red volume $V_r = 33(4/11) = 12$ L; blue volume $V_b = 33(7/11) = 21$ L. Cost $C = p_r V_r + p_b V_b = (18 \text{ yuan/L})(12 \text{ L}) + (12 \text{ yuan/L})(21 \text{ L}) = 468 \text{ yuan}$.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence
. Accurate conditions, checks or qualification.

3.2 Use successive multipliers. $P = P_0(1 - 0.15)(1 + 0.10) = (400 \text{ yuan})(0.85)(1.10) = 374 \text{ yuan}$. Relative change $r = (P - P_0)/P_0 = (374 - 400)/400 = -0.065$, a 6.5% decrease.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence.
Accurate conditions, checks or qualification.

3.3 $t = V/q = (54 \text{ L})/(0.15 \text{ L/s}) = 360 \text{ s} = 6 \text{ min}$. Convert side before squaring: $A = s^2 = (0.30 \text{ m})^2 = 0.09 \text{ m}^2$; the area conversion factor is 10000, not 100.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence.
Accurate conditions, checks or qualification.