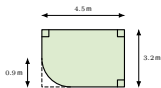


A Rounded-Corner Deck: Two Quotes



Compare the two suppliers by total cost, checking any delivery condition.



Question 1. A rectangular deck measures 4.5 m by 3.2 m, with one corner rounded off with a 0.9 m radius. **Supplier A:** \$88/m², free delivery over \$1200 (else \$80 delivery). **Supplier B:** \$95/m² less a 10% discount, delivery always free. Budget \$1300.

(a) Calculate the area of the deck.

Solution A $\approx 14.23 \text{ m}^2$.

(b) Calculate the total cost from each supplier.

Solution A: $14.2262 \dots \times \$88 \approx \1251.90 (clears \$1200, free delivery). **B:** $14.2262 \dots \times \$95 \times 0.9 \approx \1216.34 .

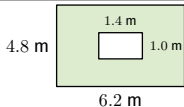
(c) Which supplier should be used, within budget? Justify your decision.

Solution Both fit. Supplier B is cheaper (\$1216.34 vs \$1251.90), even though A already gets free delivery.

Carpeting a Room: Two Quotes



Compare the two quotes by total cost, checking any delivery condition.



Question 2. A room measures 6.2 m by 4.8 m. A fireplace hearth measuring 1.4 m by 1.0 m sits inside and is not carpeted. **Quote A:** \$32 per m^2 , free delivery on orders of \$900 or more (otherwise a \$60 delivery fee). **Quote B:** \$29 per m^2 , plus a flat \$150 installation fee.

(a) Calculate the area of carpet needed.

Solution $6.2 \times 4.8 = 29.76 \text{ m}^2$; hole $1.4 \times 1.0 = 1.4 \text{ m}^2$. Area = 28.36 m^2 .

(b) Calculate the total cost of Quote A (checking whether delivery is free) and of Quote B.

Solution A: $28.36 \times \$32 = \907.52 ; this already clears \$900, so delivery is free. B: $28.36 \times \$29 + \$150 = \$822.44 + \$150 = \$972.44$.

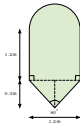
(c) Which quote should be accepted? Justify your decision.

Solution Quote A: it is \$64.92 cheaper (\$907.52 vs \$972.44) and already qualifies for free delivery.

A School Sign: Two Suppliers



Compare the two suppliers by total cost.



Question 3. A school sign is a 1.2 m square with a semicircular dome on top and a triangular point (0.3 m deep) at the bottom. **Supplier X:** \$150 per m^2 , plus a \$40 cutting fee. **Supplier Y:** \$175 per m^2 , with a 15% loyalty discount for schools, no fee.

(a) Calculate the total area of the sign.

Solution Square 1.44 m^2 ; semicircle $\approx 0.57 \text{ m}^2$; triangle 0.18 m^2 . Total $\approx 2.19 \text{ m}^2$.

(b) Calculate the total cost from Supplier X and from Supplier Y.

Solution X: $2.1855 \dots \times \$150 + \$40 \approx \$367.82$. **Y:** $2.1855 \dots \times \$175 \times 0.85 \approx \325.09 .

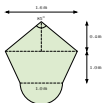
(c) Which supplier should the school use? Justify your decision.

Solution Supplier Y: it is about \$42.73 cheaper (\$325.09 vs \$367.82), even though its listed rate per m^2 is higher, because the 15% discount outweighs Supplier X's flat fee.

A Garden Gate Topper: Two Materials



Compare the two material options within the given budget.



Question 4. A decorative gate topper combines a trapezium body (bottom 1.6 m, top 1.0 m, height 1.0 m), a semicircular dome, and a triangular point (0.4 m deep). **Aluminium:** \$210 per m^2 , no fee.

Timber: \$165 per m^2 , plus a \$55 sealant-treatment fee. Budget: \$450.

(a) Calculate the total area of the topper.

Solution Trapezium 1.3 m^2 ; triangle 0.32 m^2 ; semicircle $\approx 0.39 \text{ m}^2$. Total $\approx 2.01 \text{ m}^2$.

(b) Calculate the total cost of the aluminium option and the timber option.

Solution Aluminium: $2.0127 \dots \times \$210 \approx \422.67 . Timber: $2.0127 \dots \times \$165 + \$55 \approx \$387.10$.

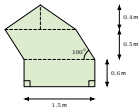
(c) Both options fit the budget. Which should be chosen? Justify your decision, including a non-cost factor.

Solution Timber is \$35.57 cheaper, but aluminium needs no ongoing sealant maintenance – a buyer wanting low upkeep could reasonably choose aluminium instead.

A Garden Feature: Two Paint Options



Compare the two paint options by total cost.



Question 5. A garden feature combines a rectangle ($1.5 \text{ m} \times 0.6 \text{ m}$), a parallelogram section (0.5 m tall), and a triangular top (0.4 m tall).

Option 1: tins at \$39, covering 2 m^2 per coat, needs 2 coats. **Option 2:** tins at \$52, covering 3 m^2 per coat, needs only 1 coat.

(a) Calculate the total area of the feature.

Solution Rectangle 0.9 m^2 ; parallelogram 0.75 m^2 ; triangle 0.3 m^2 . Total = 1.95 m^2 .

(b) For each option, calculate the total tins required and the total cost.

Solution Option 1: 2 coats need 3.9 m^2 of coverage, $3.9 \div 2 = 1.95$, round UP = 2 tins. Cost = $2 \times \$39 = \78 . Option 2: 1 coat needs 1.95 m^2 , $1.95 \div 3 = 0.65$, round UP = 1 tin. Cost = $1 \times \$52 = \52 .

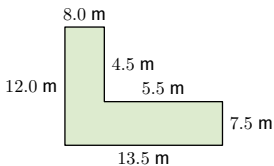
(c) Which option should be chosen? Justify your decision.

Solution Option 2: it is \$26 cheaper (\$52 vs \$78) and needs only 1 coat instead of 2, so it is both cheaper and less work.

Fencing an L-Shaped Yard



Compare the two fencing options within the given budget.



Question 6. An L-shaped yard has these dimensions: left height 12.0 m, top width 8.0 m, inner drop 4.5 m, inner horizontal 5.5 m, right height 7.5 m, bottom width 13.5 m. A 3.0 m gate needs no fencing. **Option A:** 10 m rolls, \$215 each, plus \$180 gate. **Option B:** \$26/m continuous, plus \$150 gate. Budget \$1400.

(a) Calculate the perimeter, then the fencing needed once the gate gap is removed.

Solution $P = 51.0$ m. Needed = 48.0 m.

(b) Calculate the total cost of Option A and of Option B.

Solution A: 5 rolls. Cost = $5 \times \$215 + \$180 = \$1255.00$. B: $48.0 \times \$26 + \$150 = \$1398.00$.

(c) Both options fit budget. Which should be chosen? Justify your decision.

Solution Option A: \$143 cheaper. Option B only just fits.