



Criterion D task

Resurfacing the Basketball Court

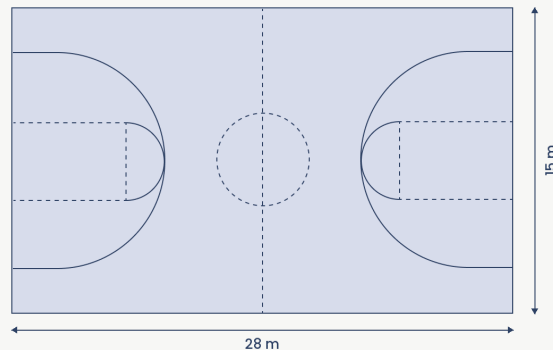
Criterion D Applying mathematics in real-life contexts Year MYP 2 / Grade 7

Topics Area, unit rates and cost modelling

Part A

One paint, one budget

The school basketball court, which measures 28 m by 15 m, needs to be resurfaced. The maintenance company sells resurfacing paint in tins that each cover 32 m^2 and cost \$45 per tin. The school has a budget of \$650 for this project.



Basketball court diagram (not to scale)

- 1 **Identify** the information you will need from this situation to solve the problem, and any assumptions you will make.

- 2 **Determine** how many tins of paint are needed, and whether the project stays within budget.

- 3 **Justify** why you rounded the number of tins the way you did, and explain whether your final answer is reasonable in this context.



Part B

Comparing paint options

The maintenance company actually offers two paint options for the court:

covers 32 m² Standard Paint \$45 per tin Reapply every 2 years	vs	covers 40 m² Premium Paint \$68 per tin Reapply every 4 years
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8

The school wants to know which option is the better **long-term** choice over the next **8 years**, not just which one is cheaper right now.

4

Using your method from Part A, **determine** the cost of resurfacing the court once with Premium Paint.

5

Compare the total cost of using Standard Paint versus Premium Paint over an 8-year period, taking into account how often each paint needs to be reapplied.

6

Analyse your results and write a recommendation to the school. Recommend a paint option, justify it using your calculations, comment on the degree of accuracy of your comparison, and explain whether your recommendation makes sense in context.



Check your work

What Criterion D looks for

When you have finished, tick each strand you think your answers show. Then read your work again as if you were the teacher.

- ☐ **i. Identify relevant elements**
I picked out the information that matters, and stated the assumptions my model depends on. (Question 1)
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- ☐ **ii. Select a strategy**
I chose a mathematical method that fits the situation, without being told which one to use. (Questions 2 and 4)
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- ☐ **iii. Apply it**
I carried out the strategy correctly and reached a valid solution. (Questions 2, 4 and 5)
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- ☐ **iv. Degree of accuracy**
I explained how my rounding affects my answer, and why that is the right choice here. (Questions 3 and 6)
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- ☐ **v. Does it make sense?**
I checked my answer against the real situation: the budget, the paint and the future. (Questions 3 and 6)

For parents and teachers

Checking thinking

Part A: what a strong response shows

- The values needed: court area ($28 \times 15 = 420 \text{ m}^2$), coverage of one tin (32 m^2), price per tin (\$45) and the budget (\$650), and an assumption such as “the whole court is painted, with one coat”.
- $420 \div 32 = 13.125$, so **14 tins** are needed. $14 \times \$45 = \630 , which is within the \$650 budget.
- Rounding up is justified because a part tin cannot be bought, and 13 tins would not quite cover the court. Spills and touch-ups make a little extra paint sensible.

Part B: what a strong response shows

- Premium: $420 \div 40 = 10.5$, so **11 tins**. $11 \times \$68 = \748 for one coat.
- Over 8 years, assuming the court is painted at the start: Standard is applied in years 0, 2, 4 and 6 (4 times, $4 \times \$630 = \$2,520$). Premium is applied in years 0 and 4 (2 times, $2 \times \$748 = \$1,496$).
- There is no single correct recommendation. A strong answer supports its choice with the calculations, notes how rounding to whole tins affects the totals, and weighs the long-term saving against this year's \$650 budget and the assumption that prices stay the same.

Written by Shannon Mellon, MYP Math Tutor. The full article, with a worked example and student responses, is at mymathtutor.com/articles/what-is-criterion-d. This work has been developed independently from and is not endorsed by the International Baccalaureate Organization. Criterion strands: © IB, *MYP Mathematics Guide*, 2020.