

**Mathematics
Practice Test Booklet
for the PSSA**

**Grade 11
Question 25**



A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

Problem Solution:

$$12'8'' \times 18'9'' = 152'' \times 225'' = 34200 \text{ in}^2$$

$$8'' \times 8'' = 64 \text{ in}^2$$

$$34200 \text{ in}^2 \div 64 \text{ in}^2/\text{tile} = 534.375 \text{ tiles} \therefore 535 \text{ tiles are needed}$$

Other Methods:

$$152'' \div 8''/\text{tile} = 19 \text{ tiles for width of floor}$$

$$225'' \div 8''/\text{tile} = 28.125 \text{ tiles for length of floor or 29 tiles}$$

$$19 \text{ tiles/row} \times 29 \text{ rows of tiles} = 551 \text{ tiles}$$

Some number of tiles between 535 and 551 that explains correctly how the number of tiles was determined (i.e. 19 tiles/row x 28 rows + 10 tiles cut in half for 29th row = 542 tiles)

5 Correct solution with all work shown and explained – cannot contain any flaws:

$$12'8'' \times 18'9'' = 152'' \times 225'' = 34200 \text{ in}^2$$

$$8'' \times 8'' = 64 \text{ in}^2$$

$$34200 \text{ in}^2 \div 64 \text{ in}^2/\text{tile} = 534.375 \text{ tiles} \therefore 535 \text{ tiles are needed}$$

Other correct solutions based on decimal approximation:

a) $152'' \div 8''/\text{tile} = 19 \text{ tiles for width of floor}$

$$225'' \div 8''/\text{tile} = 28.125 \text{ tiles for length of floor or 29 tiles}$$

$$19 \text{ tiles/row} \times 29 \text{ rows of tiles} = 551 \text{ tiles}$$

b) some number of tiles between 535 and 551 that explains correctly how the number of tiles was determined

$$\text{(i.e. } 19 \text{ tiles/row} \times 28 \text{ rows} + 10 \text{ tiles cut in half for } 29^{\text{th}} \text{ row} = 542 \text{ tiles)}$$

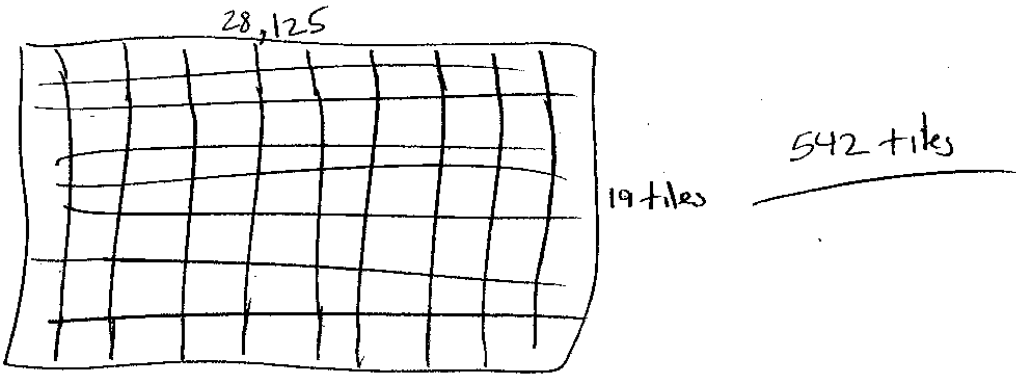
4 Correct solution with all work shown and some explanation
May contain minor flaws, i.e. incorrect unit within the problem

3A Correct solution with some work and no explanation

- 3B** Incorrect solution due to one calculation or rounding error i.e. or not rounding
Note: rounding number of tiles down is a conceptual error (see 2C), not a rounding error
- 3C** Correct solution with some work and some solution
- 2A** Correct solution with minimal work or some explanation
- 2B** Incorrect solution due to multiple calculation errors
- 2C** Incorrect answer due to conceptual error
 1) $225/8 = 28.125$ rounded to 28
 2) 534.375 rounded to 534
 3) $34200 \text{ in}^2 \div 8 \text{ in/tile} = 4275$ tiles
- 2D** Incorrect answer: stopped with 34200 in^2 , found the area the tiles need to cover but not the number of tiles
- 1A** Correct solution with no work or explanation
- 1B** Determines the number of tiles in perimeter $(152/8 + 225/8)(2) = 96$
- 1C** Attempts to find the area of the floor and/or divides to get the number of tiles
 1) $(12.8)(18.9) \div 8 = 30.24$
 2) $(13)(19) = 247 \div 64$ or $247 \div 8$
- 0** Multiple errors with incorrect solution or incomplete solution

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.



First I converted my into inches so everything would be comparable. The floor turned out to be 225 in. by 152 inches. I divided it out to figure out how many tiles I needed. The floor need 19 tiles \times 28,125 tiles. Since one side wasn't a whole number I rounded down to figure out how many full tiles I would need it turned out to be 532 tiles. The tiles that I had to cut I could get 2 out of each because there is a border around them. I calculated that number by dividing 19 by 2 and get 9.5 tiles. Since you can't by $\frac{1}{2}$ of a tile I rounded up to 10. My total amount of tiles turned out to be 542 tiles to tile the floor.

5 – Do they need to show work when changing to inches?

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

$18\text{ft } 9\text{in} = 225\text{in}$
 $(18)(12) + 9 = 225\text{in.}$
 $(12)(12) + 8 = 152\text{in}$
 $12\text{ft } 8\text{in.}$
 152in
 $8 \overline{)152}$
 $\underline{-8}$
 72
 $\underline{-72}$
 0
 $8 \overline{)225}$
 $\underline{-16}$
 65
 $\underline{-64}$
 1
 551 tiles

First I drew a diagram of the floor. I then converted the measurement to inches by multiply 12 inches by every foot. Next I figured out how many tiles it would take to go from one side to the other by dividing the length of the side by the length of a tile. I rounded many fractions up because you can't buy part of a tile. After finding how many tiles it would take to stretch the length of the floor on each side, I multiplied the two numbers together to get the total number of tiles it would take. It would take 551 tiles.

5 - 551 tiles

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

$$\textcircled{1} \quad 12\text{ft} + \frac{12\text{in}}{12} = 144\text{in} + 8\text{in} = 152\text{in} \quad 18\text{ft} + \frac{12\text{in}}{12} = 216\text{in} + 9\text{in} = 225\text{in}$$

$$225\text{in} \times 152\text{in} = 34,200\text{in}^2 \quad 8 \times 8 = 64\text{in}^2$$

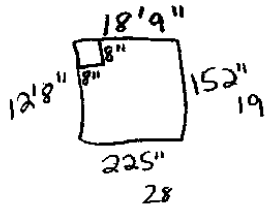
$$\frac{34,200\text{in}^2}{64\text{in}^2} = 534.375 \text{ tiles} \approx 535 \text{ tiles need to be bought}$$

The first thing you must do is convert the 12ft 8in and 18ft 9in into inches. Multiply 12 by 12 and then add 8in to the answer. This will give the width of the floor in inches. Next, multiply 18 by 12 and add 9in to that answer. This will get the length in inches. Multiply the length times the width of the floor to get the area of the floor. Then multiply 8 by 8 to get the area of the tiles. Divide the area of the floor by the area of the square. The answer will be 534.375 tiles. Since one can not buy .375 of a tile round up one number. Getting the final answer of 535 tiles. The reason for converting feet to inches is simple. A person must do this because you must keep all measurements the same when adding, multiplying, subtracting, and dividing in order to get the correct number in the correct unit of measurement. Again the final answer is 535 tiles.

5 - 535 tiles

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.



Visual representation of what's given

$18 \cdot 12 + 9 = 225$	feet + in. into inches
$12 \cdot 12 + 8 = 152$	feet + in. into inches
$225 \text{ module } 8 = 28$	full tiles along a side
$152 \text{ module } 8 = 19$	full tiles along other side
$(28 \cdot 8) \cdot (19 \cdot 8) = 34048 \text{ in}^2$	total area covered by full tiles
$225 \cdot 152 = 34200 \text{ in}^2$	total area to be covered
$28 \cdot 19 + 19 = 551$	total tiles needed

4 – Not enough explanation

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

28.125
 $18'9''$
 $12'8''$
 19

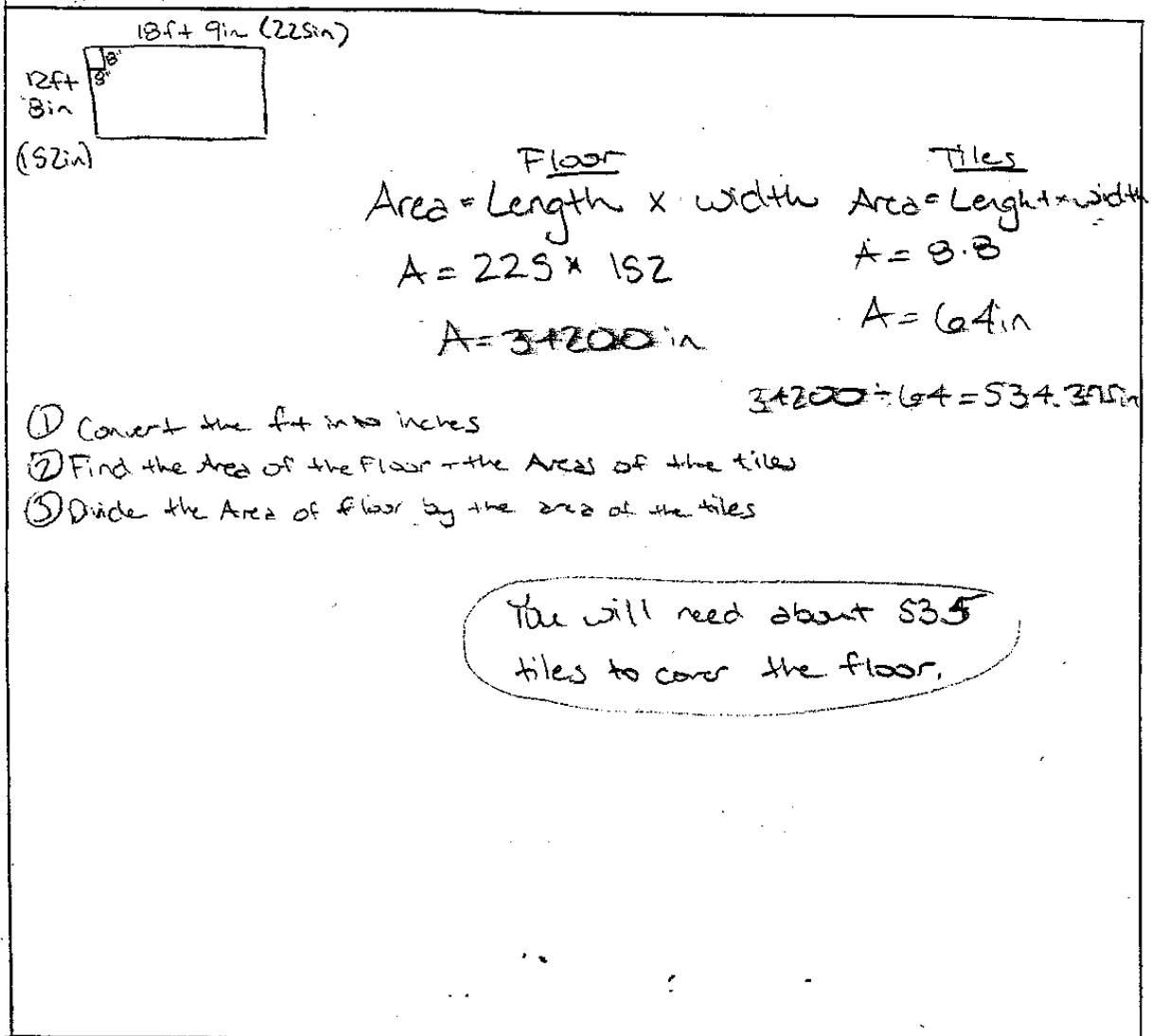
551 tiles

$12'12'' + 8'' = 162''$
 $162 \div 8_{\text{tiles}} = 19 \text{ tiles}$
 $18'12'' + 9'' = 225''$
 $225 \div 8_{\text{tiles}} = 28.125 \rightarrow 29 \text{ tiles}$
 $19_{\text{tiles}} + 29_{\text{tiles}} = 551 \text{ tiles}$
 You need 551 tiles because you cannot have a $.125^{\text{th}}$ of a tile.

4 – Little explanation

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.



18ft 9in (225in)

12ft 8in (152in)

8"

Floor
 $\text{Area} = \text{Length} \times \text{width}$
 $A = 225 \times 152$
 $A = 34200 \text{ in}$

Tiles
 $\text{Area} = \text{Length} \times \text{width}$
 $A = 8 \cdot 8$
 $A = 64 \text{ in}$

$34200 \div 64 = 534.375 \text{ in}$

- ① Convert the ft into inches
- ② Find the area of the floor + the area of the tiles
- ③ Divide the area of floor by the area of the tiles

You will need about 535 tiles to cover the floor.

3A – Correct solution. Some work.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

18'9" 12'8"

18'9" → 18.75' X 12.66' = 237.38 sq ft

X 12'8" →

~~237.38 sq ft~~

8" = .66'

.66' x .66' = .4356 sq ft

→ .4356 sq ft

237.38 sq ft

544.95 tiles

545 tiles

you find the area of the floor by using the formula $A = LW$. Each measurement was converted to decimal form for easier calculations. 18.75' was multiplied by 12.66' to arrive at 237.38 square ft.

This answer was then divided by the area of ~~each~~ 8" square. This was done by converting 8 inches into a decimal of .66. This number was then squared by using the area formula of a square. This resulted in .4356 square ft. Next 237.38 sq ft was divided by .4356 sq ft to arrive at 544.95 tiles which was rounded up ~~to~~ to 545 tiles, since you can't buy .95 tiles.

3B – Incorrect. One rounding error.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

$12'8''$
 $18'9''$

12 feet 8 inches = $12 \cdot 12 + 8 = 152$ inches
18 feet 9 inches = $18 \cdot 12 + 9 = 225$ inches

Area = $152 \cdot 225 = 34,200 \text{ in}^2$

Perimeter = $152 + 152 + 225 + 225 = 754 \text{ in.}$


Area of a tile = $8 \cdot 8 = 64 \text{ in}^2$

$34,200 \div 64 = 534.375$ tiles

3B – Did not round

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.



18 ft 9 in
12 ft. 8 in.

216 inches
152 inches

Find area. Turn all into ft/in. I will do inches. 12×12 is $144 + 8 = 152$, $18 \times 12 = 216 + 9 = 216$. The $a = LW$

$(216)(152)$ 32,832 in. is area

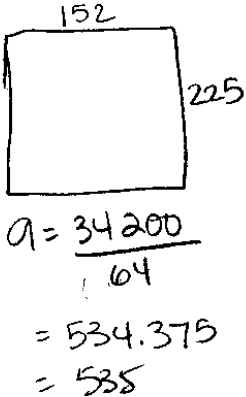
Find area of square $8 \times 8 = 64$
divide $32832 \div 64 = \underline{\underline{513 \text{ tiles}}}$

I chose to change this to inches earlier b/c I know there are 12 inches in a ft. I could just multiply the foot amount by 12 to get inches - then I wouldn't have any decimals

3B – Incorrect. One calculation error.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.



152

225

$$A = \frac{34200}{64}$$
$$= 534.375$$
$$= 535$$

1. Convert feet to inches because tiles are measured in inches
2. Find total area to determine how many square inches of tile are needed
3. Divide total area by 64 since each tile contains 64 square inches
4. Add one more tile to the result because the floor needs to be covered completely and you can't buy part of a tile

3C – Correct with some work and explanation.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

12' 8" = 152"

18' 9" = 225"

8" 8" → 64"

$225" \times 152" = 34200$

$34200 \div 64 = 534.375$

= 535 tiles need to be bought
(534.375 are used)

2A – Correct solution with minimal work.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

18ft 9in (225in)

12ft 8in (152in)

8in

Floor
 $\text{Area} = \text{Length} \times \text{width}$
 $A = 225 \times 152$
 $A = 34200 \text{ in}^2$

Tiles
 $\text{Area} = \text{Length} \times \text{width}$
 $A = 8 \cdot 8$
 $A = 64 \text{ in}^2$

$34200 \div 64 = 534.375$


- ① Convert the ft into inches
- ② Find the Area of the Floor + the Area of the tiles
- ③ Divide the Area of floor by the area of the tiles

You will need about 534 tiles to cover the floor.

2C – Incorrect due to conceptual error.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

$18'9$
 $12'8$

$12'8 = 152$ inches
 $18'9 = 225$ inches

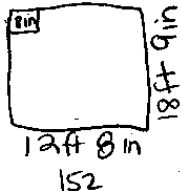
$A = LW$
 $= (225)(152)$
 $A = 34200$
 $34200 \div 8 = 4275$

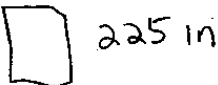
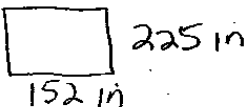

1. Drew visual picture of floor so that I could understand the problem better & marked the measurements for it
2. Took 12ft. 8in & 18ft. 9in. & converted all of the feet into inches & added the inches so that It was easier to work w/
3. Listed all info given
4. Sat up problem using equation $A=LW$ so that I could find the total area
5. Expanded the equation by multiplying 225in by 152in. which equals $A = 34200$ in.
6. Then I took the measurement of 1 tile & divided it by the total Area to get the total number of tiles needed which is 4275 tiles

2C – Incorrect due to conceptual error.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.



1. First I try to draw a picture to start thinking about it.
2. Label sides
3. find total area of the floor
4. take Length times width because it is in ft and inches
5. Convert in all inches
6. $18 \text{ ft} \times 12 = 216 \text{ in}$ (12 is # of in. in a ft)
7. add the leftover 9 in
8.  225 in
9. Do the same for length
10. $12 \text{ ft} \times 12 = 144$
11. Add 8 in \Rightarrow
12. 152 \leftarrow
13.  225 in
152 in
14. find area of tile 
15. $(\times) 8 \times 8$ for area
16. 64"
17. Now multiply 225 by 152 to get total area
18. Ans. 34,200

2D – Incorrect. Found area but not tiles.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

A hand-drawn diagram of a rectangular floor. The left vertical side is labeled $12' \times 8$ and the bottom horizontal side is labeled 18×9 . To the right of the diagram, the number 535 is written and circled, followed by the word "tiles".

1A – Correct solution. No work or explanation.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor?

Show your work and explain the steps you used to justify your answer. Do all work for this problem in the box below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculations steps must be shown and explained in writing. Numeric answers must always be labeled.

12 ft 8 in
18 ft 9 in

8 inch tiles

- 1) Draw a picture of what the info was telling me
- 2) Converted 12ft and 18ft into inches. I know that 12 inches equals a foot.

$$\begin{array}{r} 12 \\ \times 12 \\ \hline 144 \end{array}$$
 inches + the additional 8 inches equals 152 inches

$$\begin{array}{r} 18 \\ \times 12 \\ \hline 216 \end{array}$$
 inches + the additional 9 inches equals 225 inches
- 3) In order to find the perimeter of the area, I added all four sides to get to total amount | equals

$$152 + 152 + 225 + 225 = 754$$
- 4) Then with the total amount, 754, I would then divide by 8 because that's how big the tiles are that are going to placed in the area.

$$8 \div 754 = 94.25$$

 * So therefore you would use 94 1/2 tiles for the floor

1. Drew because it gave me a view of what to do.
2. Converted into inches because it would be easier to work with
3. Added to find perimeter
4. Divided by eight so I could get the final answer.

1B – Determines tiles in perimeter.

A kitchen floor measures 12 feet 8 inches wide by 18 feet 9 inches long. The floor is being covered with tiles that are 8 inch squares. How many tiles must be bought to cover the floor? Show your work and justify your answer.

Show your work and explain the steps you used to justify your answers. Do all work for this problem in the shaded region below. Remember you must show all the steps you used to solve the problem even if you have used a calculator. To receive the highest score, all calculation steps must be shown and verbally explained. Numerical answers must always be labeled.

$A = L \times W$
12.8 x 18.9 multiply 12.8 by 18.9
248ft. 6 inches $\frac{248.6}{8}$ divide 248.6 by 8
The answer comes up 8
248ft and 6 inches 31 Tiles must be bought
The answer comes up 31.075.
If you round your answer you
get 31

1C – Attempts to find area/divides to get number of tiles.