NCETM: KS3 Multiplicative Reasoning Project

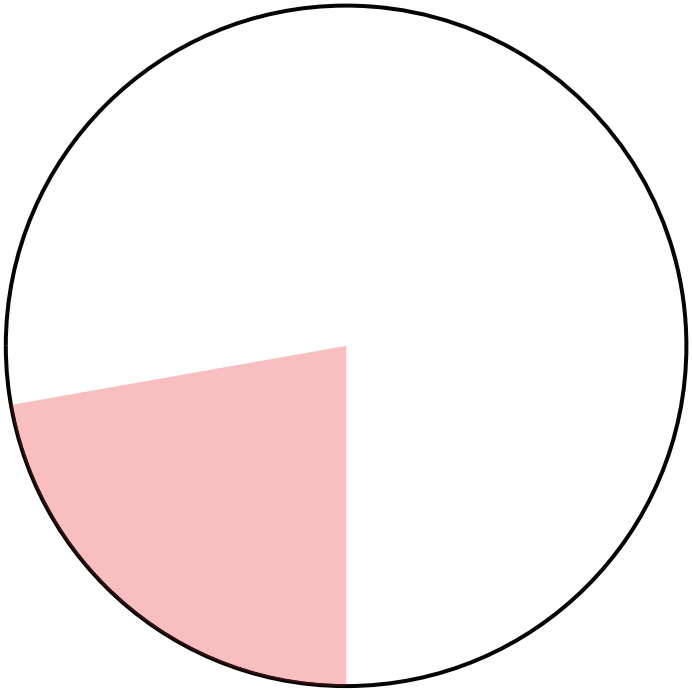
Slides for LESSON 1b

National Centre for Excellence in the Teaching of Mathematics

Stage 1:

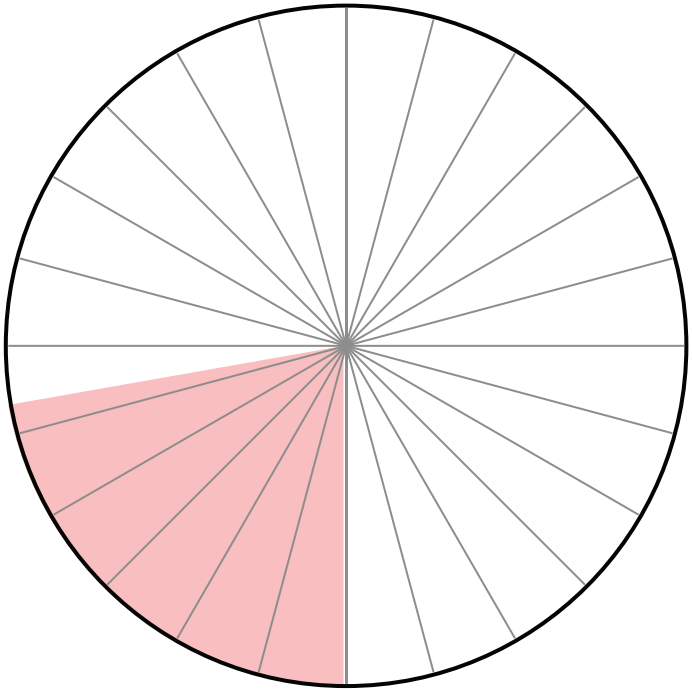
This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?



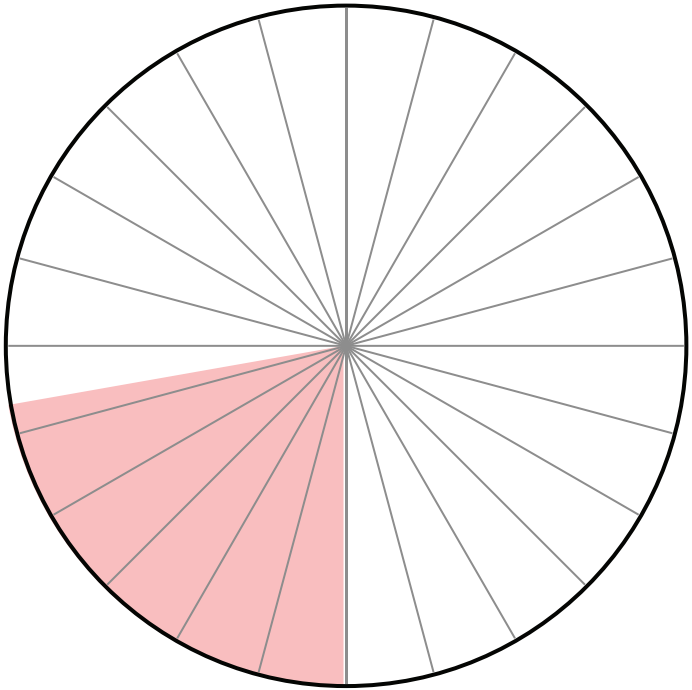
Stage 1:

b. Karl wants to cut the cake into lots of equal pieces, in this kind of way:



Stage 1:

b. Karl wants to cut the cake into lots of equal pieces, in this kind of way:



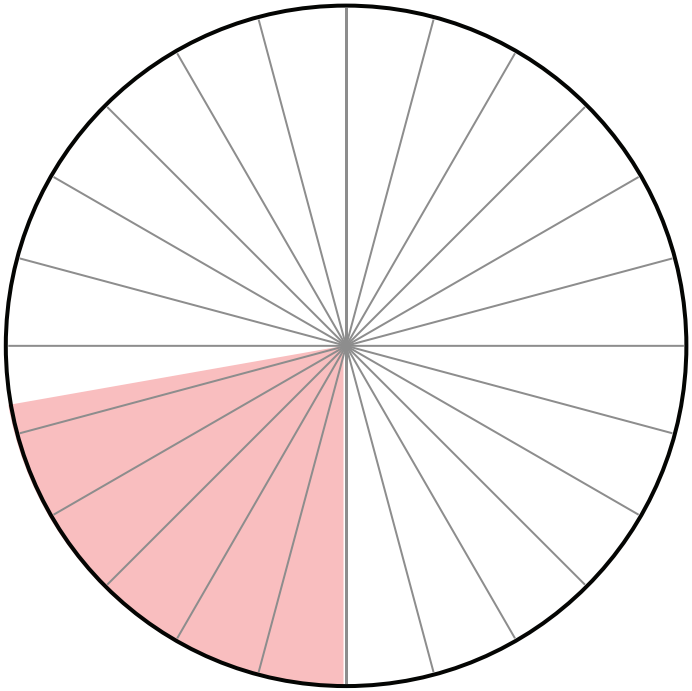
i. *Imagine* that he cuts the cake into 60 equal pieces.

Roughly, what fraction of the icing is pink?

Give your answer in 60ths.

Stage 1:

b. Karl wants to cut the cake into lots of equal pieces, in this kind of way:



i. *Imagine* that he cuts the cake into 60 equal pieces.

Roughly, what fraction of the icing is pink?

Give your answer in 60ths.

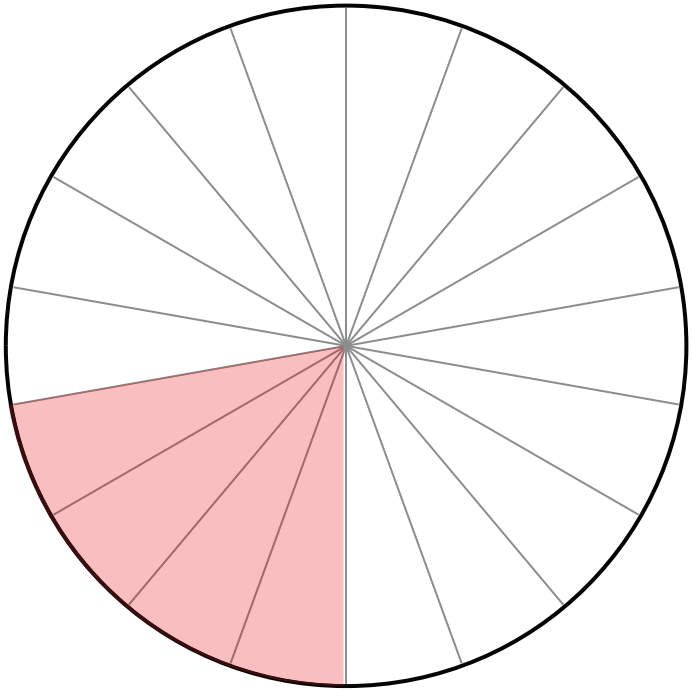
ii. *Imagine* that he cuts the cake into 100 equal pieces.

Roughly, what fraction of the icing is pink?

Give your answer in 100ths.

Stage 1:

c. In the end, Karl carefully cuts the cake into these equal pieces:

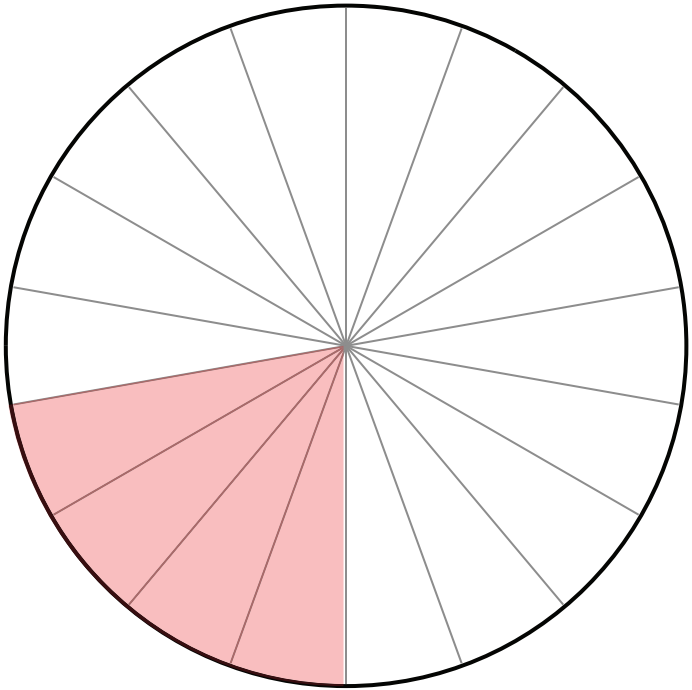


Stage 1:

c. In the end, Karl carefully cuts the cake into these equal pieces:

What fraction of the icing is pink?

Use the drawing to find the fraction as accurately as you can.

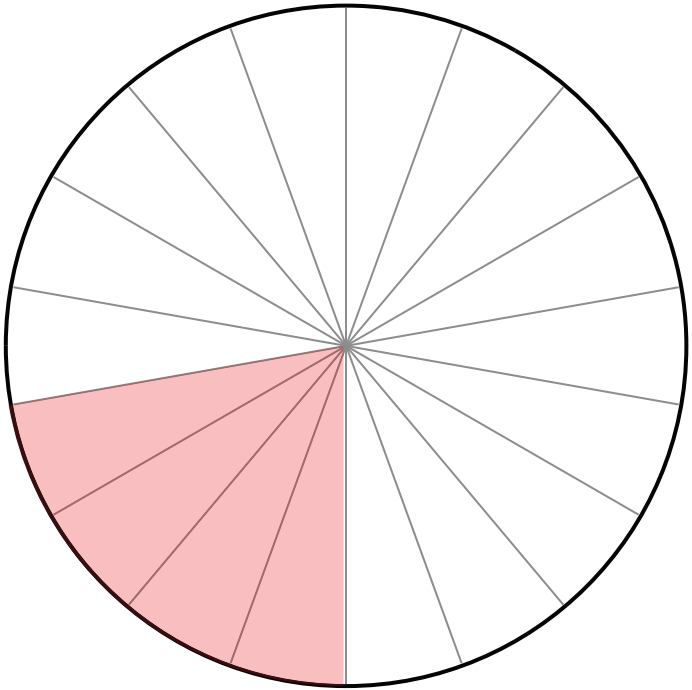


Stage 1:

c. In the end, Karl carefully cuts the cake into these equal pieces:

What fraction of the icing is pink?

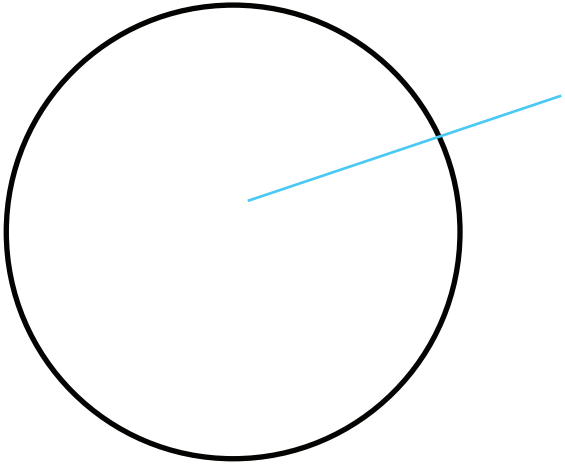
Use the drawing to find the fraction as accurately as you can.



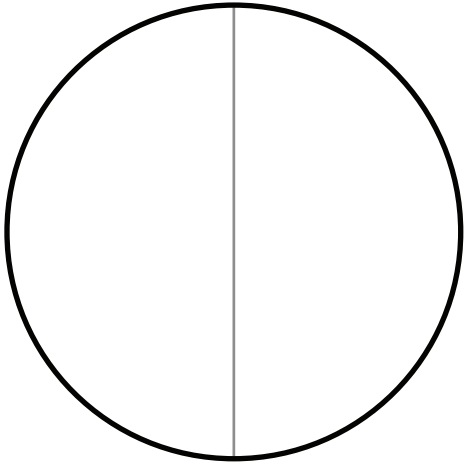
d. Compare your estimates in parts a) and b) with your answer in part c).

Find different ways of doing this.

Stage 2:
Rosa likes cutting up cakes.



She cuts
this cake into
2 equal pieces. →



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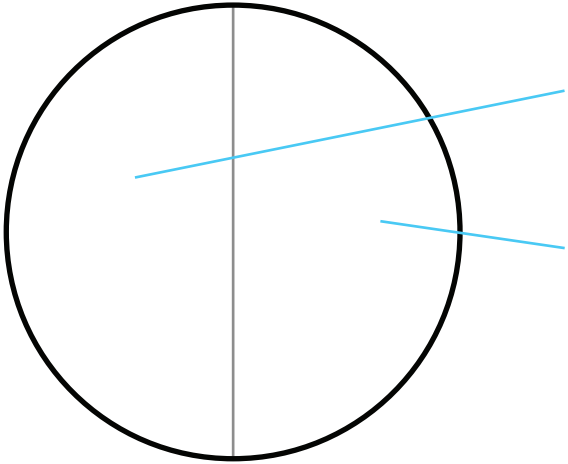
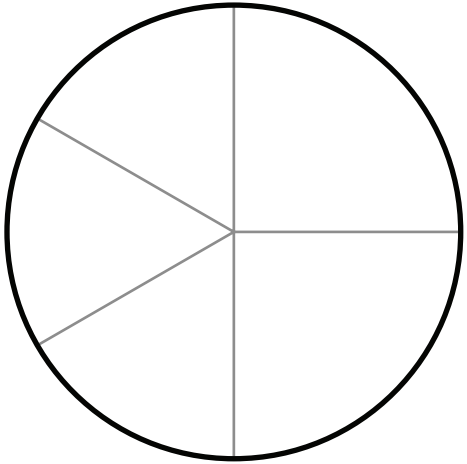


She now cuts
this piece into
3 equal pieces →
and
this piece into
2 equal pieces.→



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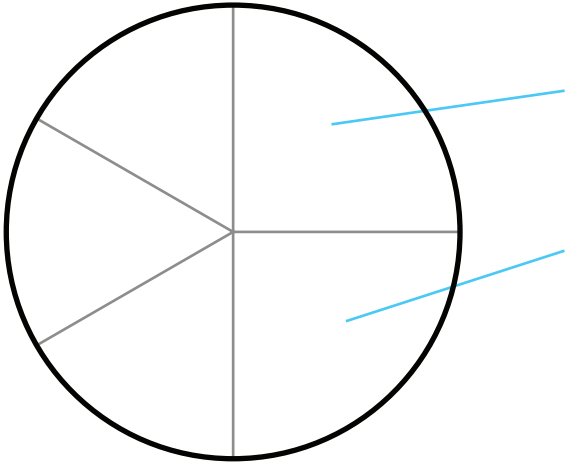
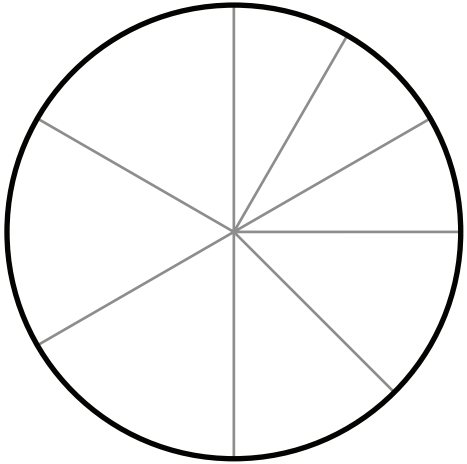
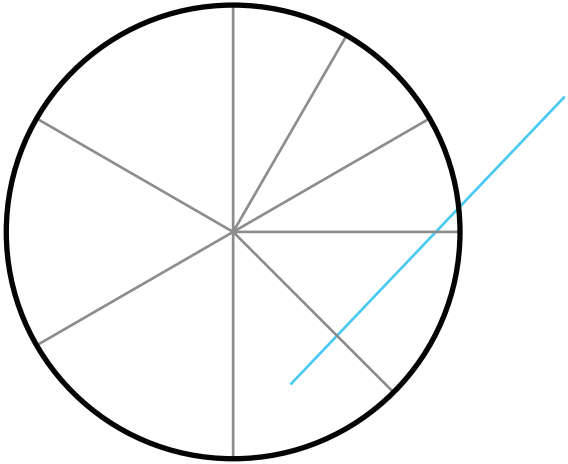


She now cuts
this piece into
3 equal pieces →
and
this piece into
2 equal pieces.→

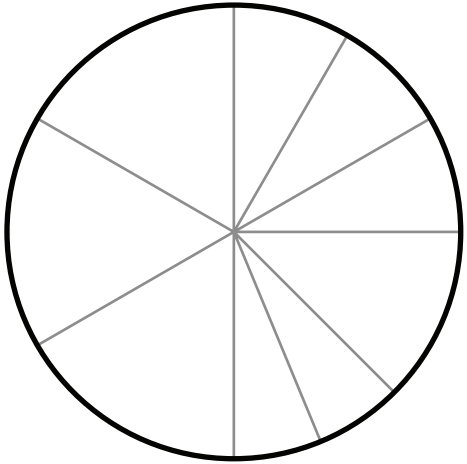


Stage 2:

Rosa likes cutting up cakes.



She now cuts this piece into 2 equal pieces.→

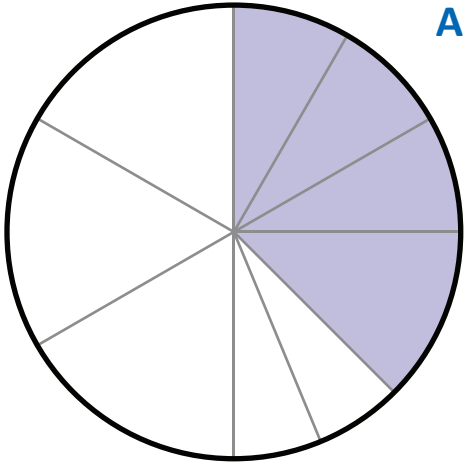


Stage 2:

Rosa eats the part of the cake shown by the shaded region.

a. Estimate *roughly* how much of the cake she eats.

b. Find the *exact* amount.



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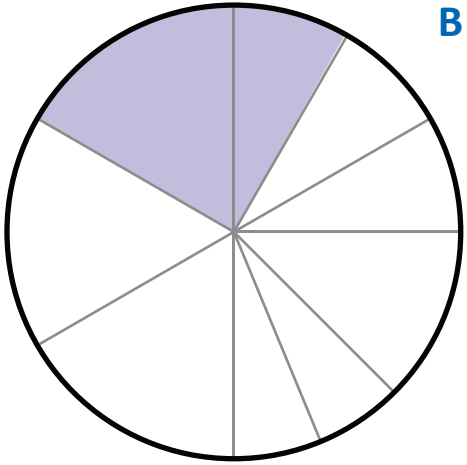
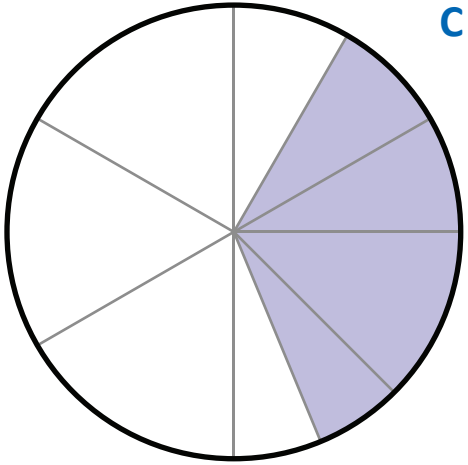


Stage 2:

Rosa eats the part of the cake shown by the shaded region.

a. Estimate *roughly* how much of the cake she eats.

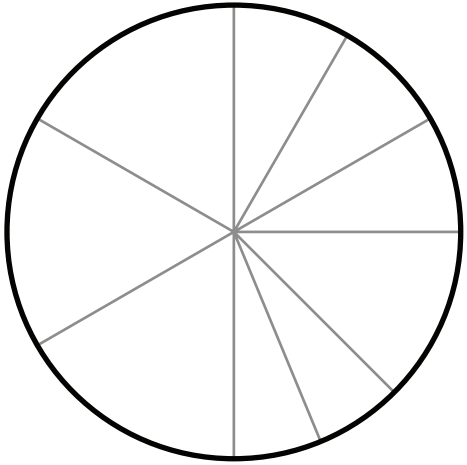
b. Find the *exact* amount.



Stage 2:
Shade part of the cake.

a. Estimate *roughly* how much of the cake is shaded.

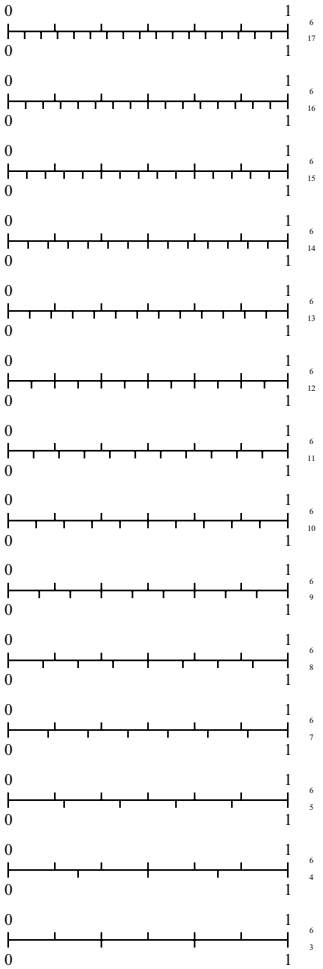
b. Find the *exact* amount.



Stage 3, Extension:

Each of the lines shows two sets of fractions.

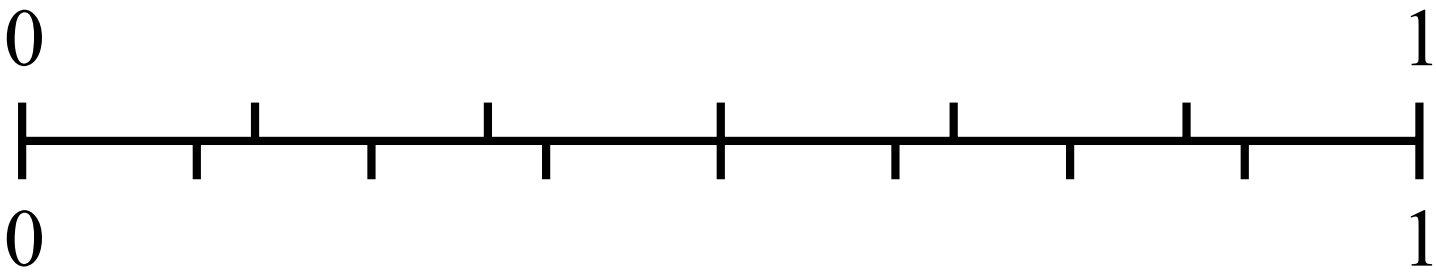
Zoom-in to see a particular line.



Stage 3, Extension:

Each of the lines shows two sets of fractions.

a. Choose the line showing sixths and eighths.



Number each of the given marks (ie $\frac{1}{6}$, $\frac{2}{6}$, etc and $\frac{1}{8}$, $\frac{2}{8}$, etc).

b. Use the drawing to estimate the size of the 'smallest gap' between marks on the top and bottom scales (eg the gap between $\frac{5}{6}$ and $\frac{7}{8}$).

c. Explain how you can check your estimate.

d. Use the line to help you write some subtraction expressions involving sixths and eighths, eg $\frac{7}{8} - \frac{5}{6} = ...$ Give them to your partner to solve.

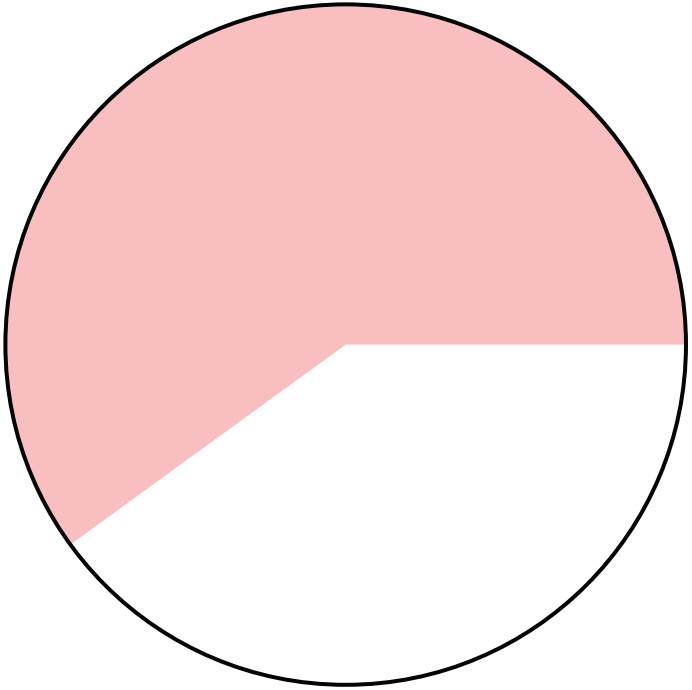
Stage 1 (alternative A):

This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?

b. Roughly, what fraction is pink i. in 60ths ii. in 100ths?

c. What fraction of the icing is pink?



Stage 1 (alternative A):

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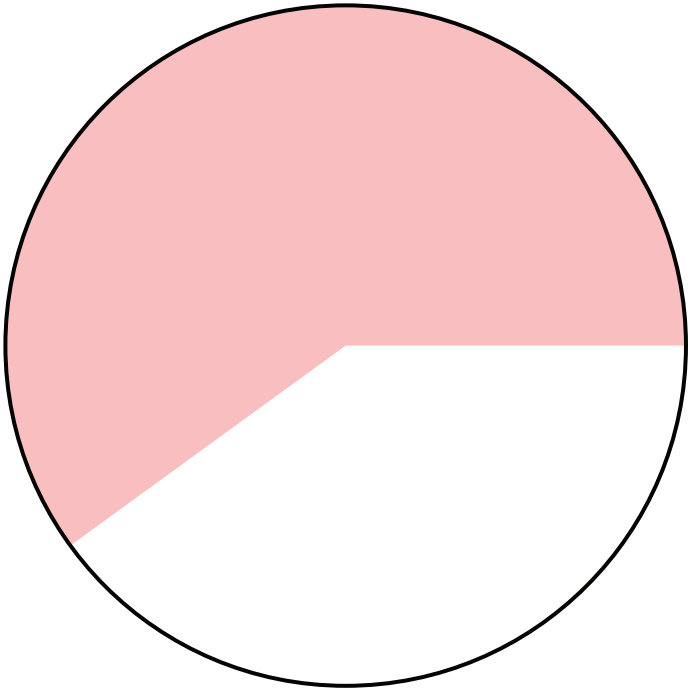
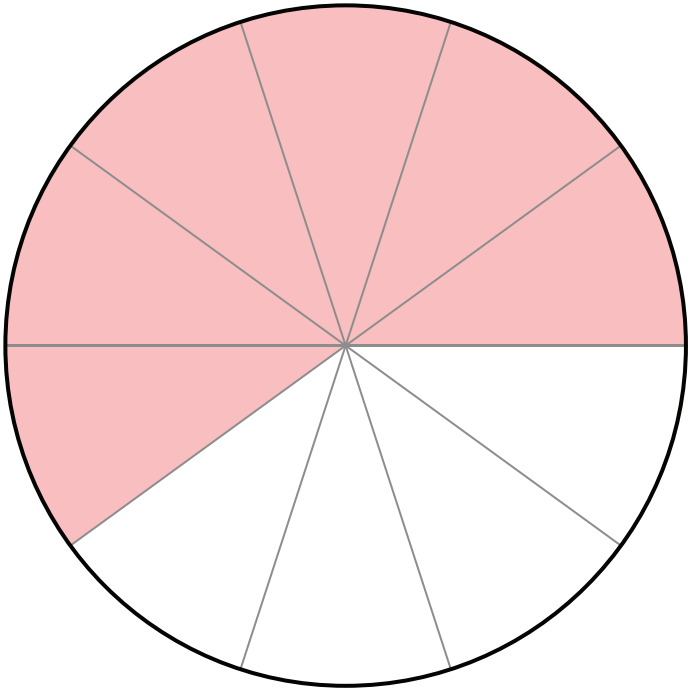




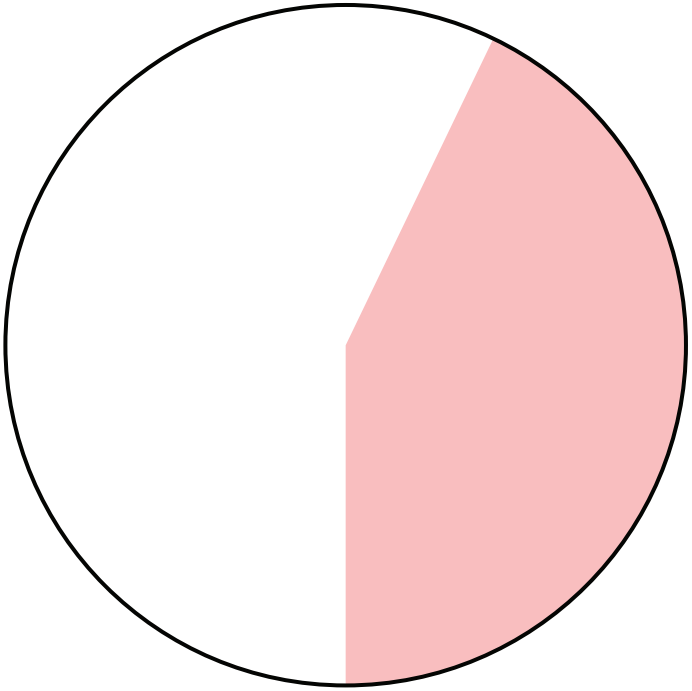
Stage 1 (alternative B):

This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?

b. Roughly, what fraction is pink i. in 60ths ii. in 100ths?

c. What fraction of the icing is pink?



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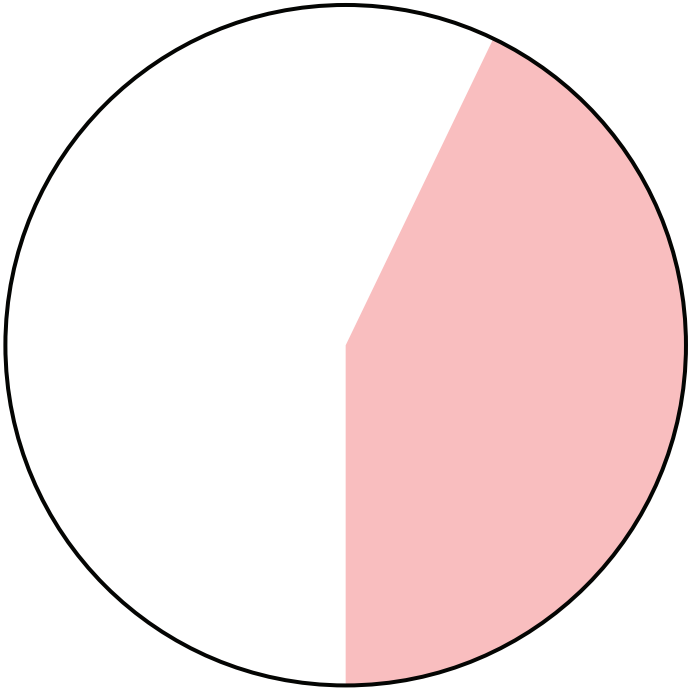
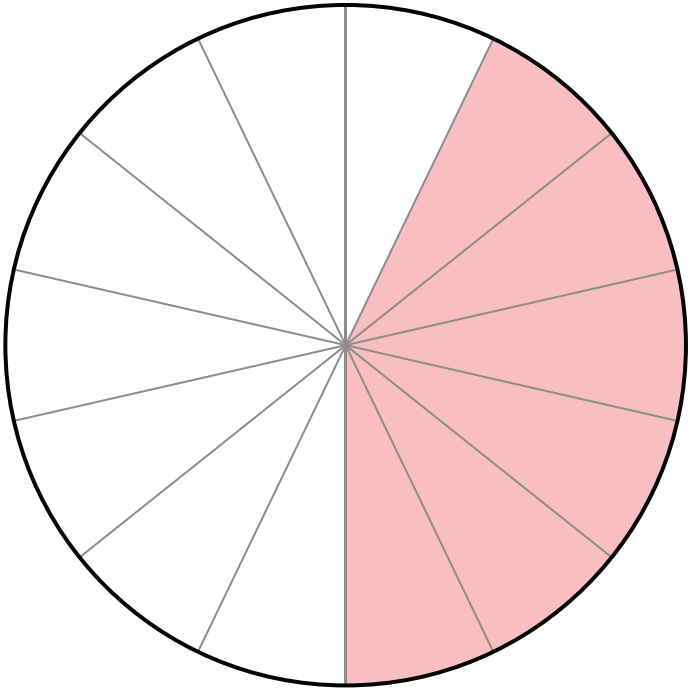




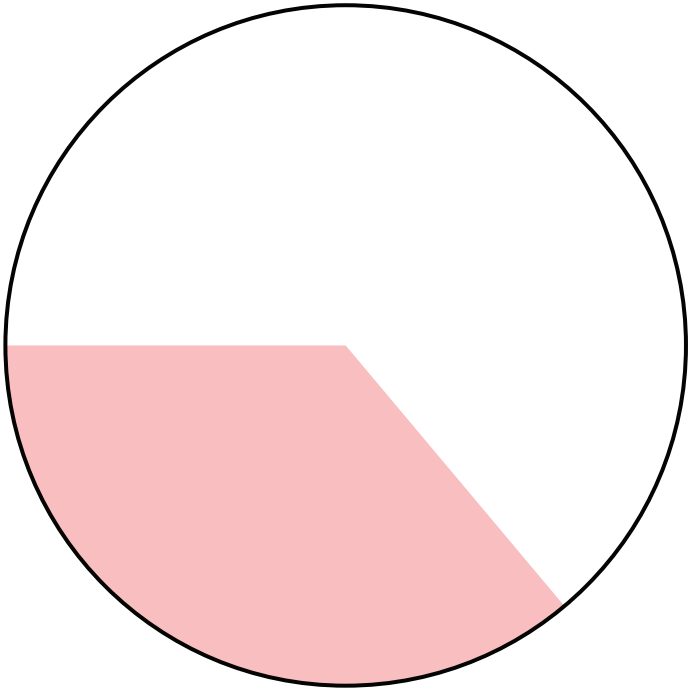
Stage 1 (alternative C):

This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?

b. Roughly, what fraction is pink i. in 60ths ii. in 100ths?

c. What fraction of the icing is pink?



Stage 1 (alternative C):

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a. Roughly, what fraction of the icing is pink?

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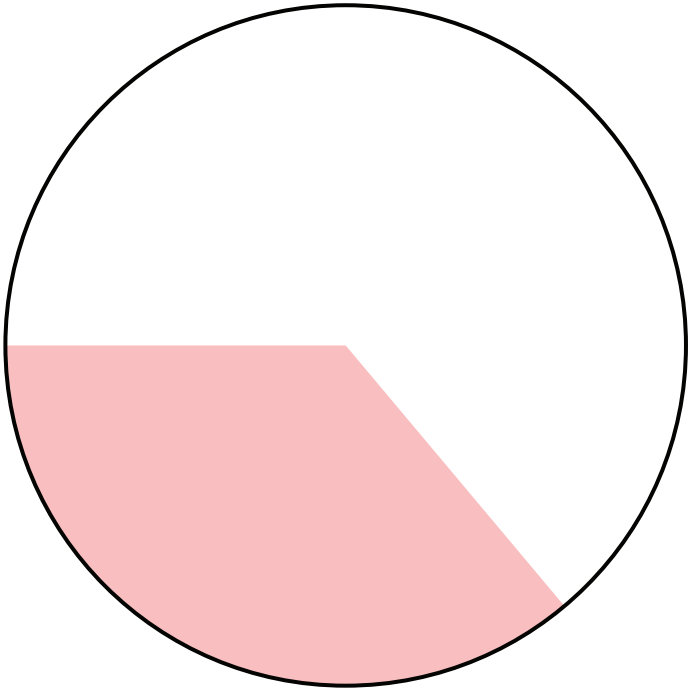
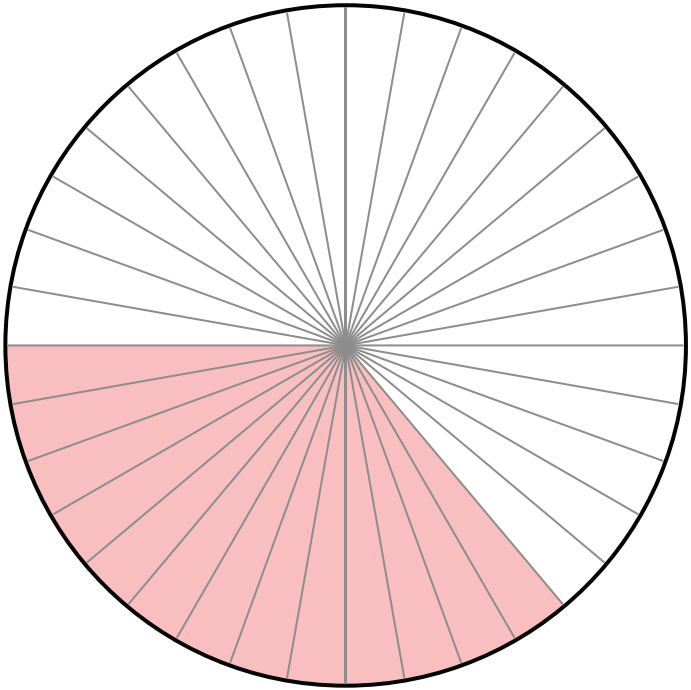
c. What fraction of the icing is pink?





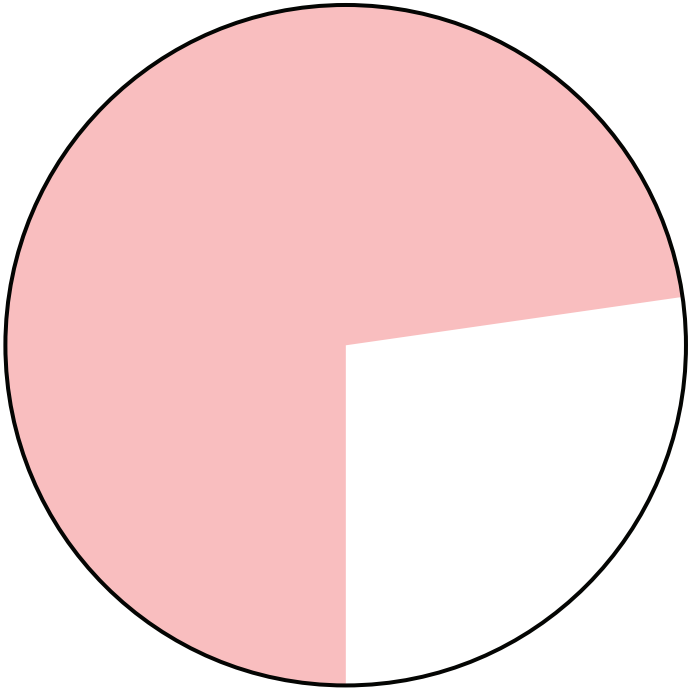
Stage 1 (alternative D):

This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?

b. Roughly, what fraction is pink i. in 60ths ii. in 100ths?

c. What fraction of the icing is pink?



Stage 1 (alternative D):

This cake is covered in white icing and pink icing:

a. Roughly, what fraction of the icing is pink?

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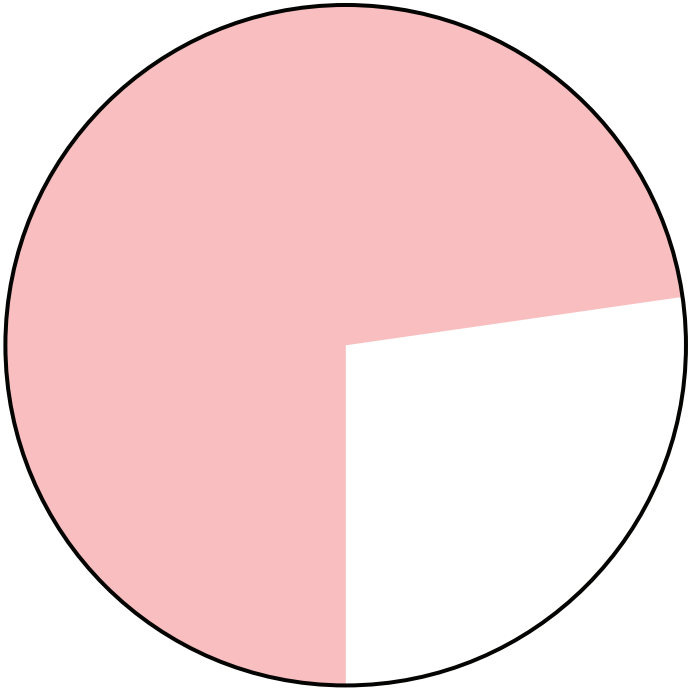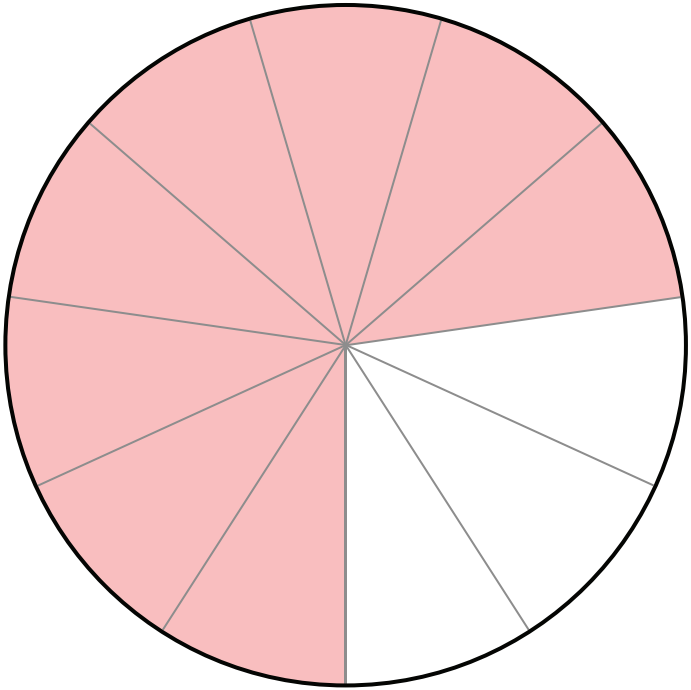
c. What fraction of the icing is pink?