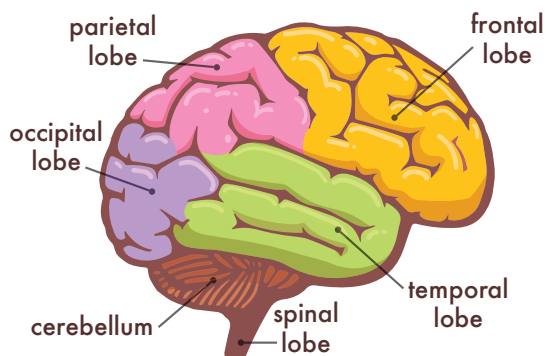


7.8 Divide Mixed Numbers

Construct Meaning



The human brain is divided into four lobes. The lobes are separated by the various grooves and bumps on the surface of the brain. Each lobe performs a different function. The lobes are called the frontal lobe, parietal lobe, occipital lobe, and temporal lobe.

The surface area of the parietal lobe is about $5\frac{1}{3}$ sq ft. It is divided into two major regions. What is the average surface area of each region?

$$5\frac{1}{3} \div 2$$

$$\frac{16}{3} \div \frac{2}{1}$$

Rename the mixed number as an improper fraction.

Rename the whole number as a fraction.

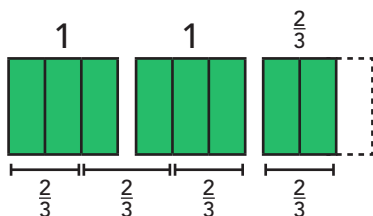
Use the shortcut:

$$\frac{16}{3} \times \frac{1}{2} \quad \text{Multiply by the reciprocal.}$$

$$\frac{16}{6} = 2\frac{4}{6} = 2\frac{2}{3} \quad \text{Rename the improper fraction as a mixed number.}$$

The average surface area is $2\frac{2}{3}$ sq ft.

Solve $2\frac{2}{3} \div \frac{2}{3}$.



Rename the mixed number as an improper fraction.

$$\frac{8}{3} \div \frac{2}{3}$$

Multiply by the reciprocal.

Cross-cancel.

$$\frac{4\cancel{8}}{\cancel{3}} \times \frac{3}{\cancel{2}3} = \frac{4}{1} \times \frac{1}{1}$$

Rename the improper fraction.

$$\frac{4}{1} \times \frac{1}{1} = \frac{4}{1} = 4$$

Solve $2\frac{2}{9} \div 2\frac{2}{3}$.

Rename the mixed numbers.

$$\frac{20}{9} \div \frac{8}{3}$$

Multiply by the reciprocal.

$$\frac{20}{9} \times \frac{3}{8}$$

Cross-cancel. Multiply.

$$\frac{5\cancel{20}}{\cancel{3}9} \times \frac{\cancel{3}1}{\cancel{8}2} = \frac{5}{3} \times \frac{1}{2} = \frac{5}{6}$$

Estimating Quotients

Round each mixed number to the nearest whole number to estimate the quotient.

$$6\frac{1}{9} \div 2\frac{3}{4} \quad \text{Round and then divide.}$$

$$6 \div 3 = 2$$

$$5\frac{2}{3} \div 1\frac{1}{5} \quad \text{Round and then divide.}$$

$$6 \div 1 = 6$$

Check Understanding

Solve.

a. $\frac{6}{7} \div 1\frac{5}{7}$

b. $3\frac{1}{8} \div \frac{5}{6}$

c. $6\frac{2}{5} \div \frac{8}{15}$

d. $2\frac{1}{9} \div 2\frac{2}{9}$

Estimate.

e. $1\frac{3}{4} \div 1\frac{1}{6}$

f. $8\frac{2}{9} \div 4\frac{1}{4}$

g. $9\frac{1}{3} \div 3\frac{1}{4}$

h. $1\frac{7}{8} \div 1\frac{2}{9}$

Practice

Write each mixed number as an improper fraction.
Then, write its reciprocal.

1. $4\frac{1}{2}$

2. $1\frac{5}{8}$

3. $7\frac{1}{7}$

4. $3\frac{4}{9}$

5. $8\frac{2}{3}$

6. $6\frac{1}{9}$

Estimate the quotient.

7. $4\frac{1}{3} \div 2\frac{1}{5}$

9. $5\frac{6}{7} \div 3\frac{1}{8}$

11. $13\frac{1}{4} \div 1\frac{2}{9}$

13. $8\frac{2}{31} \div 4\frac{3}{43}$

8. $9\frac{3}{5} \div 2\frac{2}{9}$

10. $15\frac{3}{8} \div 5\frac{3}{8}$

12. $23\frac{3}{5} \div 5\frac{7}{8}$

14. $17\frac{18}{25} \div 2\frac{3}{4}$

Find the quotient.

15. $4\frac{1}{2} \div 12$

17. $4\frac{3}{8} \div 3\frac{1}{2}$

19. $8\frac{1}{3} \div \frac{5}{9}$

21. $\frac{2}{5} \div 3\frac{3}{5}$

16. $7\frac{4}{5} \div \frac{3}{5}$

18. $5 \div 1\frac{1}{7}$

20. $\frac{5}{7} \div 1\frac{2}{3}$

22. $5\frac{1}{4} \div 8\frac{1}{6}$

Apply

23. A baby's weight at one year was about $2\frac{1}{2}$ times her weight at birth. At one-year of age she weighed $22\frac{1}{2}$ pounds. What was her weight at birth?

24. Cecily filled the bird feeder from a $10\frac{1}{2}$ -pound bag. Every day the birds ate $\frac{1}{5}$ pound. How many days could the birds eat before Cecily needed to refill the feeder?

25. Arnav is covering the bathroom shelves in his house. He has $11\frac{1}{4}$ feet of shelving paper. How many shelves can he cover if each shelf is $1\frac{1}{2}$ feet long?

Review

26. $1\frac{1}{2} + 2\frac{1}{4}$

30. $7\frac{5}{9} + 3\frac{4}{9}$

27. $3\frac{2}{9} + 1\frac{1}{9}$

31. $2\frac{1}{5} + 3\frac{3}{4}$

28. $8\frac{1}{4} + 2\frac{1}{8}$

32. $2\frac{2}{12} + 2\frac{5}{6}$

29. $6\frac{7}{8} + 4\frac{1}{8}$

33. $3\frac{9}{10} + 4\frac{1}{5}$

