

$\frac{5}{6}$  5%  $\frac{2}{5}$  20%  $\frac{7}{8}$   $\frac{2}{7}$   $\frac{3}{8}$   
 $\frac{1}{3}$  95%  
66%  $\frac{1}{7}$   
10%  $\frac{8}{9}$  50%  $\frac{4}{9}$  25%  
 $\frac{5}{8}$   $\frac{4}{5}$   $\frac{1}{6}$  35%  $\frac{1}{8}$   
33%

# Fractions to Percentages

# Halves, Quarters and Eighths

Remember the equivalent fractions for halves, quarters and eighths.

$\frac{1}{2}$				$\frac{2}{2}$			
$\frac{1}{4}$		$\frac{2}{4}$		$\frac{3}{4}$		$\frac{4}{4}$	
$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$

$$\frac{1}{4} = \frac{2}{8} \text{ and } \frac{3}{4} = \frac{6}{8}$$

This will help you find the equivalent percentages.

# Halving and Combining

Many equivalent percentages can be found by doubling and halving known percentages.

$$\frac{1}{2} = 50\%$$

$$\frac{1}{4} \text{ is half of } \frac{1}{2} \text{ so } \frac{1}{4} = 25\%$$

$$\frac{3}{4} = \frac{1}{2} + \frac{1}{4} = 50\% + 25\% = 75\%$$

We can extend this to  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{5}{8}$  and  $\frac{7}{8}$ .

$$\frac{1}{8} \text{ is half of } \frac{1}{4} \text{ so } \frac{1}{8} = \frac{1}{2} \text{ of } 25\% = 12.5\%$$

$$\frac{3}{8} = \frac{1}{4} + \frac{1}{8} = 25\% + 12.5\% = 37.5\%$$

$$\frac{5}{8} = \frac{1}{2} + \frac{1}{8} = 50\% + 12.5\% = 62.5\%$$

$$\frac{7}{8} = \frac{3}{4} + \frac{1}{8} = 75\% + 12.5\% = 87.5\%$$

# Fifths and Tenths

Remember the equivalent fractions for halves, fifths and tenths.

$\frac{1}{2}$					$\frac{2}{2}$				
$\frac{1}{5}$		$\frac{2}{5}$		$\frac{3}{5}$		$\frac{4}{5}$		$\frac{5}{5}$	
$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$

$$\frac{1}{2} = \frac{5}{10}$$

$$\frac{1}{5} = \frac{2}{10}$$

$$\frac{2}{5} = \frac{4}{10}$$

$$\frac{3}{5} = \frac{6}{10}$$

$$\frac{4}{5} = \frac{8}{10}$$

# Halving and Combining

Fifths and tenths are mainly found by combining the required number of tenths as  $\frac{1}{10} = 10\%$

$$\frac{5}{10} = \frac{1}{2} = 50\%$$

$$\frac{1}{5} = \frac{2}{10} = 20\%, \quad \frac{2}{5} = 40\%, \quad \frac{3}{5} = 60\%, \quad \frac{4}{5} = 80\%$$

$$\frac{1}{10} = 10\%, \quad \frac{3}{10} = 30\%, \quad \frac{7}{10} = 70\%, \quad \frac{9}{10} = 90\%$$

# Thirds, Sixths and Twelfths

Remember the equivalent fractions for halves, thirds, sixths and twelfths.

$\frac{1}{2}$						$\frac{2}{2}$					
$\frac{1}{3}$				$\frac{2}{3}$			$\frac{3}{3}$				
$\frac{1}{6}$	$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$						
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$	$\frac{11}{12}$	$\frac{12}{12}$

$$\frac{1}{2} = \frac{3}{6} = \frac{4}{8}$$

$$\frac{1}{3} = \frac{2}{6} = \frac{4}{12} \quad \text{and} \quad \frac{2}{3} = \frac{4}{6} = \frac{8}{12}$$

$$\frac{1}{6} = \frac{2}{12} \quad \text{and} \quad \frac{5}{6} = \frac{10}{12}$$

# Halving and Combining

Many of the equivalent percentages for thirds, sixths and twelfths use the recurring 3333 or 6666. Use this along with halving and combining to find the equivalent percentages.

$$\frac{1}{3} = 33.3\%, \frac{2}{3} = 66.66\% \text{ rounded to } 66.7\%$$

When halving 33.3% we know half of 32 = 16 and use half of 1.33  $\approx$  0.67 so  $\frac{1}{6} = 16.7\%$ .

Look for the best way to combine the percentages to find all the equivalents.

# Combining Twenty-Fifths

We know that  $25 \times 4 = 100$  so  $\frac{1}{25} = 4\%$ .

To find the equivalent percentage of  $\frac{12}{25}$  we multiply 12 by 4.

$$\frac{12}{25} = 48\%.$$

Try other twenty-fifths.



# Calculating Equivalent Percentages

Equivalent percentages can be calculated by dividing the numerator by the denominator (to find the equivalent decimal) and multiplying by 100 to give the percentage.

$$\frac{1}{2} \quad 2 \overline{) 1.0} \quad 0.5 \times 100 = 50\%$$

$$\frac{5}{8} \quad 8 \overline{) 5.000} \quad 0.625 \times 100 = 62.5\%$$

# Calculating Sevenths

$$\frac{1}{7} \quad \frac{0.142857}{7 \overline{)1.000000}} \times 100 = 14.2857\%$$

$$\frac{2}{7} \quad \frac{0.285714}{7 \overline{)2.000000}} \times 100 = 28.5714\%$$

$$\frac{3}{7} \quad \frac{0.428571}{7 \overline{)3.000000}} \times 100 = 42.8571\%$$

# Calculating Sevenths

$$\frac{4}{7} \quad \frac{0.571428}{7 \overline{)4.000000}} \times 100 = 57.1428\%$$

$$\frac{5}{7} \quad \frac{0.714285}{7 \overline{)5.000000}} \times 100 = 71.4285\%$$

$$\frac{6}{7} \quad \frac{0.857142}{7 \overline{)6.000000}} \times 100 = 85.7142\%$$

# Calculating Sevenths

14.2857%    28.5714%    42.8571%    57.1428%    71.4285%    85.7142%

What do you notice about the pattern made by the equivalent percentages to the sevenths? Look at the order of the digits.

The digits are always in the same order, starting with a different digit each time.

Which digits are never used?

3, 6 and 9

Answers

$\frac{5}{6}$  5%  $\frac{2}{5}$  20%  $\frac{7}{8}$   $\frac{2}{7}$   $\frac{3}{8}$   
 $\frac{1}{3}$  70%  $\frac{4}{7}$  5% 95%  
66%  $\frac{1}{7}$   
10%  $\frac{8}{9}$  50%  $\frac{4}{9}$  25%  
 $\frac{5}{8}$   $\frac{4}{5}$   
33% 99%  $\frac{1}{6}$  35%  $\frac{1}{8}$