

# 7. [Decimals / Fractions / Percents]

## Skill 7.1 Ordering decimal numbers.

MMMaive 1 1 2 2 3 3 4 4  
MMLime 1 1 2 2 3 3 4 4

- Line up the decimal numbers at their decimal points.
- Compare digits in the same places, starting from the left, until you find the smallest digit.  
*Hint: The number with the smallest digit will be the smallest number.*
- Look for the second smallest number.
- Continue in this way until you find the largest number.

**Q.** Write in order from smallest to largest:  
0.325, 0.025, 0.035, 0.235

**A.** 0.025, 0.035, 0.235, 0.325

			units										
			tenths										
			hundredths										
			thousandths										
			U	.	T	H	Th						
largest	4th	0	.	3	2	5							
smallest	1st	0	.	0	2	5							
	2nd	0	.	0	3	5							
	3rd	0	.	2	3	5							

Find the smallest digits.  
Work from left to right.

**Units:** all 0

**Tenths:**  $0 < 2 < 3$   
either 0.025 or 0.035  
is the smallest

**Hundredths:**  $2 < 3$   
so 0.025 is the smallest and  
0.035 is 2nd smallest

**Tenths:**  $2 < 3$   
so 0.235 is 3rd smallest  
0.325 is the largest

**a)** Write in order from smallest to largest:  
0.606, 0.66, 0.066, 0.06

	U	.	T	H	Th	
	0	.	6	0	6	
	0	.	6	6		
	0	.	0	6	6	
	0	.	0	6		the smallest number

**b)** Write in order from largest to smallest:  
3.041, 3.04, 3.104, 3.014

	U	.	T	H	Th
	3	.	0	4	1
	3	.	0	4	
	3	.	1	0	4
	3	.	0	1	4

**c)** Write in ascending order:  
0.263, 0.236, 0.326, 0.362

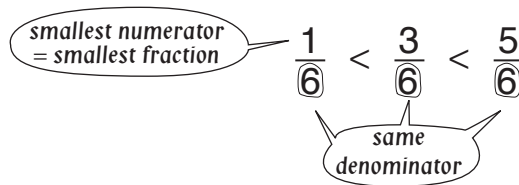
**d)** Write in descending order:  
0.052, 0.025, 0.05, 0.205

**e)** Write in descending order:  
0.075, 0.507, 0.570, 0.057

**f)** Write in ascending order:  
1.264, 1.064, 1.24, 1.246

## Skill 7.2 Ordering fractions.

- Find the least common denominator of the fractions, which is the Least Common Multiple (LCM) of the denominators.
- Change the fractions to equivalent fractions with the least common denominator.
- Arrange the fractions in order of the numerators (the smallest fraction has the smallest numerator and so on).



**Hint:** If unsure which is the LCM of the denominators, use their product as the common denominator.  
When the smaller denominators divide evenly into the biggest denominator, this biggest number becomes the common denominator.

**Q.** Write in order from smallest to largest:

$$\frac{4}{5}, \frac{21}{25}, \frac{83}{100}$$

**A.**  $\frac{4}{5}, \frac{83}{100}, \frac{21}{25}$

$$\frac{4}{5}, \frac{21}{25}, \frac{83}{100}$$

LCM of 5, 25 and 100 is 100

$$\frac{4 \times 20}{5 \times 20} = \frac{80}{100}$$

because  $100 \div 5 = 20$   $4 \times 20 = 80$

$$\frac{21 \times 4}{25 \times 4} = \frac{84}{100}$$

because  $100 \div 25 = 4$   $21 \times 4 = 84$

$$\frac{83}{100} = \frac{83}{100}$$

$$80 < 83 < 84, \text{ so } \frac{80}{100} < \frac{83}{100} < \frac{84}{100}$$

$$\text{or } \frac{4}{5} < \frac{83}{100} < \frac{21}{25}$$

**a)** Write in order from smallest to largest:

$$\frac{2}{3}, \frac{5}{6}, \frac{13}{18}$$

LCM of 3, 6 and 18 is 18

$$\frac{2 \times 6}{3 \times 6} = \frac{12}{18} \quad \frac{5 \times 3}{6 \times 3} = \frac{15}{18} \quad \frac{13}{18}$$

$$\frac{12}{18} < \frac{13}{18} < \frac{15}{18}$$

$$\frac{2}{3}, \frac{13}{18}, \frac{5}{6}$$

**b)** Write in order from largest to smallest:

$$\frac{21}{50}, \frac{2}{5}, \frac{43}{100}$$

$$\boxed{\phantom{\frac{21}{50}, \frac{2}{5}, \frac{43}{100}}}$$

**c)** Write in ascending order:

$$\frac{3}{4}, \frac{7}{9}, \frac{23}{36}$$

$$\boxed{\phantom{\frac{3}{4}, \frac{7}{9}, \frac{23}{36}}}$$

**d)** Write in descending order:

$$\frac{7}{10}, \frac{31}{50}, \frac{71}{100}$$

$$\boxed{\phantom{\frac{7}{10}, \frac{31}{50}, \frac{71}{100}}}$$

### Skill 7.3 Finding equivalent fractions.

- Check if you need to multiply or divide the numerator or denominator of the first fraction to reach the numerator or denominator of the second fraction.
- Do the same operation to the top and bottom of the fraction.

Example:

$$\frac{2}{3} = \frac{\boxed{?}}{18} \Rightarrow \frac{2 \times 6}{3 \times 6} = \frac{\boxed{12}}{18}$$

$\swarrow \times 6$

So  $\frac{2}{3}$  and  $\frac{12}{18}$  are equivalent fractions.

- Multiply or divide the numerator and denominator of the first fraction by the same number until you reach the second fraction.

**Q.** Complete the equivalent fractions:

$$\frac{30}{180} = \frac{\boxed{\phantom{00}}}{18} = \frac{1}{\boxed{\phantom{00}}}$$

**A.**  $\frac{30}{180} = \frac{?}{18} \Rightarrow \frac{30 \div 10}{180 \div 10} = \frac{3}{18}$

$\swarrow \div 10$

and  $\frac{30}{180} = \frac{1}{?} \Rightarrow \frac{30 \div 30}{180 \div 30} = \frac{1}{6}$

$\swarrow \div 30$

$$\frac{30}{180} = \frac{\boxed{3}}{18} = \frac{1}{\boxed{6}}$$

**a)** Complete the equivalent fractions:

$$\frac{5}{6} = \frac{15}{\boxed{18}}$$

$$\frac{5}{6} = \frac{15}{?} \Rightarrow \frac{5 \times 3}{6 \times 3} = \frac{15}{18}$$

.....

**b)** Complete the equivalent fractions:

$$\frac{5}{8} = \frac{\boxed{\phantom{00}}}{200}$$

.....

**c)** Complete the equivalent fractions:

$$\frac{85}{100} = \frac{17}{\boxed{\phantom{00}}}$$

.....

**d)** Complete the equivalent fractions:

$$\frac{3}{4} = \frac{\boxed{\phantom{00}}}{20} = \frac{75}{\boxed{\phantom{00}}}$$

.....

**e)** Complete the equivalent fractions:

$$\frac{64}{144} = \frac{16}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{9}$$

.....

**f)** Complete the equivalent fractions:

$$\frac{20}{70} = \frac{10}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{7}$$

.....

**g)**  $\frac{11 \times 10}{12 \times 10} = \frac{11}{12}$   
True or false?

**true**

*Simplify:  
Divide by 10*

$$\frac{11 \times 10}{12 \times 10} = \frac{11\cancel{0}}{12\cancel{0}} = \frac{11}{12}$$

.....

**h)**  $\frac{4+8}{5+8} = \frac{4}{5}$   
True or false?

**False**

**i)**  $\frac{100-6}{200-6} = \frac{1}{2}$   
True or false?

**False**

.....

## Skill 7.4 Estimating outcomes.

MMMaive 11 2 33 44  
MMLime 11 22 33 44

- Round where appropriate to the nearest whole numbers or multiples of 10.
- Create an equation from the information given.
- Calculate, where necessary, the percent of the given amount.  
(see skills 6.4, page 62 and 6.5, page 63)

**Q.** A toothpaste box weighs 8.01 g.  
Estimate how many toothpaste boxes  
would be required to make 1 kg of  
recyclable waste?

**A.**  $8.01 \approx 8$       Round 8.01 to 8 g.  
 $1000 \div 8$       1 kg = 1000 g  
 $= 125$       It would take 125 toothpaste  
boxes to make 1 kg of recyclable  
waste.

**a)** A dinner costs \$49.90. You tip 6%.  
Estimate the size of the tip.

$$49.9 \approx 50 \text{ so } \frac{6}{100} \times \frac{50}{1} = \text{Simplify: } \div 10$$

$$= 30 \div 10 = \boxed{\$3.00}$$

**b)** Dad donates half a round of golf. You pay the  
remaining \$19.85 for the round. Estimate the  
cost of a full round of golf.

$$= \boxed{\phantom{000}}$$

**c)** Advertising costs contribute 10% of the  
\$25,050 development. Estimate the cost of  
advertising.

$$= \boxed{\phantom{000}}$$

**d)** Your backyard is 124.6 yd<sup>2</sup> of which 12% is  
playground. Estimate the size of your  
playground.

$$= \boxed{\phantom{000}}$$

**e)** Concert tickets were \$149.95 until you  
found the internet discount of 12%.  
Estimate the savings if you buy online.

$$= \boxed{\phantom{000}}$$

**f)** There are an estimated 8,000,000 species of  
insects in the world of which 24% are beetles.  
Estimate the number of beetle species.

$$= \boxed{\phantom{000}}$$

**g)** Nearly 26% of Australia's 20,702,000 citizens  
applied for a passport in 2006. Estimate the  
number of Australian passports issued in 2006.

$$= \boxed{\phantom{000}}$$

**h)** You weigh 79.7 lb. If you gain 3% of your  
body weight, estimate your weight gain.

$$= \boxed{\phantom{000}}$$

## Skill 7.5 Writing a decimal number as a fraction in simplest form.

- Write the decimal number as the numerator of the fraction.
- Ignore any zeros at the start of the number.
- Use the place value of the last digit of the decimal number to determine the size of the denominator.

Example:

units	tenths	hundredths
0	.	08

= 8 hundredths =  $\frac{8}{100}$ 

Write the 8 as the numerator

8 in hundredths place, denominator = 100

- Write the fraction in simplest form. This means to divide both the numerator and the denominator by the same number.

Example:  $\frac{8}{100} \stackrel{\div 4}{=} \frac{2}{25}$

**Hint:** For the denominator, write 1 followed by one zero for each digit after the decimal point.

Example:  $0.\underline{08} = \frac{8}{\underline{100}}$

**Q.** Write 0.92 as a fraction in simplest form.

**A.**  $0.\underline{92} = \frac{92}{100}$  Write the 92 as the numerator

$= \frac{92 \div 4}{100 \div 4}$  2 zeros for 2 decimal places

$= \frac{23}{25}$  Simplify:  $\div 4$

**a)** Write 0.6 as a fraction in simplest form.

$0.6 = \frac{6}{10} \stackrel{\text{Simplify: } \div 2}{=} \frac{3}{5}$

**b)** Write 0.02 as a fraction in simplest form.

$0.02 = \frac{\quad}{\quad}$

**c)** Write 0.12 as a fraction in simplest form.

$0.12 = \frac{\quad}{\quad}$

**d)** Write 0.05 as a fraction in simplest form.

$0.05 = \frac{\quad}{\quad}$

**e)** Write 0.45 as a fraction in simplest form.

$0.45 = \frac{\quad}{\quad}$

**f)** Write 0.8 as a fraction in simplest form.

$0.8 = \frac{\quad}{\quad}$

**g)** Write 0.2 as a fraction in simplest form.

$0.2 = \frac{\quad}{\quad}$

**h)** Write 0.68 as a fraction in simplest form.

$0.68 = \frac{\quad}{\quad}$

## Skill 7.6 Writing a fraction as a terminating decimal.

When the denominator **is** a power of 10:

- Divide the numerator by the power of 10 by moving the decimal point to the left.

Example:  $\frac{27}{100} = 27 \div 100$   
 $= \overbrace{027.0} \div 100 = 0.27$  2 zeros, 2 places to the left

Hints: Fractions are just divisions.

There is a decimal point and zeros which are not written, at the end of any whole number:  $27 = 27.00$

Zeros can also be added before the number:  $27 = 027.0$

The number of zeros in the denominator shows the number of digits after the decimal point.

$$\frac{27}{100} = 0.27$$

When the denominator **is not** a power of 10: EITHER

- Multiply both the numerator and denominator by the same number to make the denominator a power of 10. (e.g. 10, 100 or 1000).

Example:  $\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100} = 0.25$  power of 10

OR

- Divide the numerator by the denominator.

Example:  $\frac{1}{4} = 1 \div 4 = 1.00 \div 4 = 0.25$

$$\begin{array}{r} 0.25 \\ 4 \overline{) 1.00} \\ \underline{4} \phantom{00} \\ 6 \phantom{0} \\ \underline{6} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \\ 0 \end{array}$$

Hint: Fractions are just divisions.

**Q.** Write  $\frac{2}{5}$  as a decimal.

**A.**  $\frac{2}{5} = \frac{2 \times 20}{5 \times 20}$  because  $100 \div 5 = 20$   
 $= \frac{40}{100}$  Make denominator a power of 10  
 $= 40 \div 100$   
 $= \overbrace{040.0} \div 100$  2 zeros, 2 places to the left  
 $= 0.40$   
 $= \mathbf{0.4}$

**OR A.**  $\frac{2}{5} = 2 \div 5$   
 $= 2.0 \div 5$   
 $= \mathbf{0.4}$

$$\begin{array}{r} 0.4 \\ 5 \overline{) 2.0} \\ \underline{10} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

**a)** Write  $\frac{3}{50}$  as a decimal.

$$\begin{aligned} &= \frac{3 \times 2}{50 \times 2} \\ &= \frac{6}{100} \\ &= \overbrace{006.0} \div 100 = \mathbf{0.06} \end{aligned}$$

**b)** Write  $\frac{9}{20}$  as a decimal.

$$\begin{aligned} &= \dots\dots\dots \\ &= \dots\dots\dots \\ &= \dots\dots\dots = \boxed{\phantom{000}} \end{aligned}$$

**c)** Write  $\frac{4}{5}$  as a decimal.

$$\begin{aligned} &= \dots\dots\dots \\ &= \dots\dots\dots \\ &= \dots\dots\dots = \boxed{\phantom{000}} \end{aligned}$$

**d)** Write  $\frac{11}{25}$  as a decimal.

$$\begin{aligned} &= \dots\dots\dots \\ &= \dots\dots\dots \\ &= \dots\dots\dots = \boxed{\phantom{000}} \end{aligned}$$

**e)** A grain elevator in Hutchinson, Kansas is half a mile long. Write this as a decimal.

$$\begin{aligned} &= \dots\dots\dots \\ &= \dots\dots\dots \\ &= \dots\dots\dots = \boxed{\phantom{000}} \end{aligned}$$

**f)** Three-quarters of the world's fish stocks have been over-exploited. Write this as a decimal.

$$\begin{aligned} &= \dots\dots\dots \\ &= \dots\dots\dots \\ &= \dots\dots\dots = \boxed{\phantom{000}} \end{aligned}$$

## Skill 7.7 Writing a fraction as a repeating decimal.

MMMaive 1 1 2 2 3 3 4 4  
MMLime 1 1 2 2 3 3 4 4

- Divide the numerator by the denominator.
- Write a decimal point and zeros at the end of the numerator to complete the division.
- In the result, when a single digit is repeating after the decimal point, write the digit only once with a bar on top.
- In the result, when a pattern of digits is repeating after the decimal point, write the pattern only once, with a bar over the first and last digit of it.

Examples:

$$\frac{5}{9} = 5 \div 9 = 5.0000... \div 9 = 0.5555... \quad \text{OR} \quad = 0.\overline{5} \quad \begin{array}{r} 0.5555 \\ 9 \overline{) 5.0000} \end{array}$$

$$\frac{1}{6} = 1 \div 6 = 1.0000... \div 6 = 0.1666... \quad \text{OR} \quad = 0.1\overline{6} \quad \begin{array}{r} 0.1666 \\ 6 \overline{) 1.0000} \end{array}$$

$$\frac{3}{11} = 3 \div 11 = 3.0000... \div 11 = 0.2727... \quad \text{OR} \quad = 0.\overline{27} \quad \begin{array}{r} 0.2727 \\ 11 \overline{) 3.0000} \end{array}$$

$$\frac{3}{7} = 3 \div 7 = 3.0000... \div 7 = 0.428571428571... \quad \text{OR} \quad = 0.\overline{428571} \quad \begin{array}{r} 0.428571428571 \\ 7 \overline{) 3.0000000000} \end{array}$$

**Q.** Write  $\frac{2}{9}$  as a repeating decimal.

**A.**  $\frac{2}{9} = 2 \div 9$   
 $= 2.0000... \div 9$   
 $= 0.2222...$   
 $= 0.\overline{2}$

$$\begin{array}{r} 0.2222 \\ 9 \overline{) 2.0000} \end{array}$$

**a)** Write  $\frac{1}{11}$  as a repeating decimal.

$$\frac{1}{11} = 1 \div 11 = 1.0000... \div 11 = \boxed{0.\overline{09}}$$

$$\begin{array}{r} 0.0909 \\ 11 \overline{) 1.0000} \end{array}$$

**b)** Write  $\frac{4}{11}$  as a repeating decimal.

$$\frac{4}{11} = 4 \div 11 = 4.0000... \div 11 = \boxed{\phantom{0.\overline{\phantom{00}}}}$$

$$\begin{array}{r} 0.36 \\ 11 \overline{) 4.0000} \end{array}$$

**c)** Write  $\frac{2}{3}$  as a repeating decimal.

$$\frac{2}{3} = 2 \div 3 = 2.0000... \div 3 = \boxed{\phantom{0.\overline{\phantom{00}}}}$$

$$\begin{array}{r} 0.66 \\ 3 \overline{) 2.0000} \end{array}$$

**d)** Write  $\frac{4}{9}$  as a repeating decimal.

$$\frac{4}{9} = 4 \div 9 = 4.0000... \div 9 = \boxed{\phantom{0.\overline{\phantom{00}}}}$$

$$\begin{array}{r} 0.44 \\ 9 \overline{) 4.0000} \end{array}$$

**e)** Write  $\frac{11}{15}$  as a repeating decimal.

$$\frac{11}{15} = 11 \div 15 = 11.0000... \div 15 = \boxed{\phantom{0.\overline{\phantom{00}}}}$$

$$\begin{array}{r} 0.73 \\ 15 \overline{) 11.0000} \end{array}$$

**f)** Write  $\frac{5}{12}$  as a repeating decimal.

$$\frac{5}{12} = 5 \div 12 = 5.0000... \div 12 = \boxed{\phantom{0.\overline{\phantom{00}}}}$$

$$\begin{array}{r} 0.41 \\ 12 \overline{) 5.0000} \end{array}$$

## Skill 7.8 Writing a percent as a fraction in simplest form.

MMMaive 1 1 2 2 3 4 4  
MMLime 1 1 2 2 3 3 4 4

- Write the percent as a fraction with the denominator of 100.
  - Simplify the fraction by dividing both the numerator and the denominator by the same number.
- Hints: Percent means “per hundred” or “out of a hundred”.

A percent is another way of writing a fraction out of one hundred.

Example: 75% is said “75 percent” and means 75 out of 100.

**Q.** Write 8% as a fraction in simplest form.

$$\begin{aligned} \text{A. } 8\% &= \frac{8}{100} \xrightarrow{\text{Simplify: } \div 4} \\ &= \frac{2}{25} \end{aligned}$$

**a)** Write 36% as a fraction in simplest form.

$$36\% = \frac{36}{100} \xrightarrow{\text{Simplify: } \div 4} = \frac{9}{25}$$

**b)** Write 6% as a fraction in simplest form.

$$6\% = \frac{\quad}{\quad}$$

**c)** Write 75% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**d)** Write 30% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**e)** Write 18% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**f)** Write 90% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**g)** Write 25% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**h)** Write 44% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**i)** If the USA unemployment rate was 5% in March 2008, what would this percent be if written as a fraction in simplest form?

$$= \frac{\quad}{\quad}$$

**j)** A 2005 survey found that 74% of teenagers owned an MP3 player or an iPod. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

**k)** If 26% of women have obtained a bachelor degree, what would this percent be if written as a fraction in simplest form?

$$= \frac{\quad}{\quad}$$

**l)** A 2008 survey found that 35% of people give to charity once a month. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$



## Skill 7.9 Writing a fraction as a percent.

### EITHER

- Find the equivalent fraction which has a denominator of 100.
- The numerator of this fraction is the equivalent percent.

Example:  $\frac{3}{10} \times \frac{10}{10} = \frac{30}{100} = 30\%$

$$\frac{P}{100} = P\%$$

### OR

- Multiply the fraction by  $\frac{100}{1}$  and include the % sign.

Example:  $\frac{3}{10} = \frac{3}{10} \times \frac{100}{1} \% \xrightarrow{\text{Simplify: } \div 10} = 30\%$

$$\text{Percent} = \text{Fraction} \times \frac{100}{1} \%$$

**Q.** What percent is 3 out of 5? **A.**  $\frac{3}{5} = \frac{3 \times 20}{5 \times 20}$  because  $100 \div 5 = 20$   $\frac{3 \times 20 = 60}{5 \times 20 = 100} = \frac{60}{100} = 60\%$  **OR** **A.**  $\frac{3}{5} = \frac{3}{5} \times \frac{100}{1} \% \xrightarrow{\text{Simplify: } \div 5} = 3 \times 20\% = 60\%$

**a)** Write  $\frac{3}{20}$  as a percent.

$$\frac{3}{20} = \frac{3 \times 5}{20 \times 5} = \frac{15}{100} =$$

**15%**

**b)** Write  $\frac{7}{10}$  as a percent.

$$\frac{7}{10} =$$

**c)** Write  $\frac{3}{25}$  as a percent.

$$=$$

**d)** Write  $\frac{14}{70}$  as a percent.

$$=$$

**e)** What percent is 15 out of 150?

$$=$$

**f)** What percent is 45 out of 50?

$$\frac{45}{50} = \frac{45}{50} \times \frac{100}{1} \% = 45 \times 2\% =$$

**90%**

**g)** Ng receives \$50 commission on a \$1000 sale. Write this as a percent.

$$=$$

**h)** In a class of 25 students, 10 play football. Write this as a percent.

$$=$$

**i)** One quarter of the men surveyed enjoy walking as their main form of physical exercise. Write this as a percent.

$$=$$

**j)** One fifth of the women surveyed enjoy aerobics/fitness as their main form of physical exercise. Write this as a percent.

$$=$$

## Skill 7.10 Writing a decimal number as a percent.

- Multiply the decimal number by 100, by moving the decimal point two places to the right.
- Add the percent sign.

Hint: Zeros can be added at the end of any decimal number:  $0.4 = 0.4000$

**Q.** Write 0.125 as a percent.

**A.**  $0.125 = 0.\overline{125} \times 100\%$   
 $= 12.5\%$

2 zeros, 2 places to the right

**a)** Write 0.03 as a percent.

$$0.03 = 0.\overline{03} \times 100\% = \boxed{3\%}$$

**b)** Write 0.2 as a percent.

$$0.2 = \dots = \boxed{\phantom{00\%}}$$

**c)** Write 0.35 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**d)** Write 0.88 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**e)** Write 0.08 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**f)** Write 0.1 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**g)** Write 0.463 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**h)** Write 0.055 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**i)** Write 1.2 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**j)** Write 2.5 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**k)** Write 0.343 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**l)** Write 0.214 as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**m)** In April 2008, one US dollar (USD) was worth 0.635 euro (EUR). Write this decimal as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

**n)** In April 2008, one US dollar (USD) was worth 0.507 British pounds (GBP). Write this decimal as a percent.

$$= \dots = \boxed{\phantom{00\%}}$$

## Skill 7.11 Writing a percent as a decimal number.

- Write the percent as a fraction out of 100.
- Divide the numerator of the fraction by 100, by moving the decimal point two places to the left.  
*Hints: Fractions are divisions.*

*There is a decimal point and zeros which are not written, at the end of any whole number:  
27 = 27.00*

*Zeros can also be added before the number: 27 = 027.00*

**Q.** Write 2.45% as a decimal.

$$\mathbf{A.} \quad 2.45\% = \frac{2.45}{100}$$

$$= 2.45 \div 100$$

$$= \widehat{00}2.45 \div 100$$

$$= \mathbf{0.0245}$$

2 zeros, 2 places to the left

**a)** Write 9% as a decimal.

$$9\% = \frac{9}{100} = \widehat{00}9.0 \div 100 = \boxed{0.09}$$

**b)** Write 4% as a decimal.

$$4\% = \quad = \quad = \boxed{\quad}$$

**c)** Write 70% as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**d)** Write 86% as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**e)** Write 2.5% as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**f)** Write 4.15% as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**g)** Income tax is 15% for an income between \$7826 and \$31,850. Write this percent as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**h)** Approximately 60% of the waste at the tip is household waste. Write this percent as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**i)** The interest rate of a credit card is 14.9%. Write this percent as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

**j)** Maximum legal blood alcohol concentration for drivers in the USA is 0.08%. Write this percent as a decimal.

$$= \quad = \quad = \boxed{\quad}$$

## Skill 7.12 Comparing and ordering decimals, fractions and percents.

- Convert the decimals, fractions and percents to the same form, by writing all as decimals, or as fractions, or as percents. (see skill 7.11, page 85)
- Compare and order the decimals, or the fractions, or the percents.

**Hint:** The most convenient form is the decimal form. Write the fractions and percents as decimals.

**Q.** Write in ascending order:

$$\frac{17}{100}, 0.7, 7\%$$

**A.**

$$\frac{17}{100} = 17 \div 100$$

$$= 0\widehat{17}.0 \div 100$$

$$= 0.17$$

Write the fraction as a decimal

2 zeros, 2 places to the left

Fraction

$$7\% = \frac{7}{100}$$

$$= 7 \div 100$$

$$= 0\widehat{07}.0 \div 100$$

$$= 0.07$$

Write the percent as a decimal

Percent

The order from smallest to largest is:

$$0.07, 0.17, 0.7 \text{ OR } 7\%, \frac{17}{100}, 0.7$$

**a)** Which is greater?

0.09 or 90%

$$90\% = \frac{90}{100} = 0\widehat{90}.0 \div 100 = 0.9$$

$$0.9 > 0.09$$

90%

**b)** Which is greater?

0.8 or 75%

.....

.....

**c)** Write in order from smallest to largest:

$$\frac{1}{3}, 0.31, 30\%$$

Fraction  $\frac{1}{3} = 1 \div 3 = 1.0 \div 3 = 0.33\bar{3} = 0.\bar{3}$

Percent  $30\% = \frac{30}{100} = 0\widehat{30}.0 \div 100 = 0.3$

$$0.3 < 0.31 < 0.\bar{3}$$

**d)** Write in descending order:

$$0.66, 6\%, \frac{6}{10}$$

Fraction .....

Percent .....

.....

.....

**e)** Write in ascending order:

$$\frac{1}{4}, 0.14, 41\%$$

Fraction .....

Percent .....

.....

.....

**f)** Write in order from largest to smallest:

$$\frac{4}{5}, 0.83, 81\%$$

Fraction .....

Percent .....

.....

.....

### Skill 7.13 Calculating simple interest.

- Write an equation from the word problem.
- To find the total investment, after interest, add the interest to the principal.

Simple Interest = principal  $\times$  rate  $\times$  time    OR     $I = prt$

**Q.** Darcy invests \$1000 at a simple interest rate of 12% per year. What did the investment equal at the end of 2 years?  
[Simple Interest = Principal  $\times$  Rate  $\times$  Time]

**A.**  $I = prt$   
 $= 1000 \times \frac{12}{100} \times 2$     *Simplify:  $\div 100$*   
 $= 10 \times 12 \times 2 = 240$   
 $1000 + 240$     *investment = principal + interest*  
 $= \mathbf{\$1240}$

**a)** How much interest would Sean pay on his credit card after 2 years if he owed \$1500 at an interest rate of 8% per year?

$I = prt = 1500 \times \frac{8}{100} \times 2 =$     *Simplify:  $\div 100$*   
 $= 15 \times 8 \times 2 =$

**b)** Paula invests \$100 for 1 year. If the interest rate is 14% per year, how much interest would Paula get?

$I =$   
 $=$

**c)** A bank account of \$1000 earns 11% simple interest. How much interest is earned after 1 year? [Simple Interest = Principal  $\times$  Rate  $\times$  Time]

$I =$   
 $=$

**d)** How much interest is paid on a loan of \$500 at a simple interest rate of 10% after 2 years? [Simple Interest = Principal  $\times$  Rate  $\times$  Time]

$I =$   
 $=$

**e)** Pedro invested \$1500 at 5% simple interest for 2 years. How much interest did he earn?

$I =$   
 $=$

**f)** How much interest would Carey pay on his credit card after 3 years if he owed \$1200 at an interest rate of 12% per year?

$I =$   
 $=$

**g)** Guy borrowed \$200 for 3 years at a simple interest rate of 7% per year. How much does Guy owe at the end of 3 years?

$I =$   
 $=$   
 Total =

**h)** Marcie invests \$750 for 4 years at a simple interest rate of 8% per year. How much does Marcie get back?

$I =$   
 $=$   
 Total =

**Skill 7.14** Calculating compound interest/growth.

- Write an equation for the word problem.
- Calculate the amount of interest each year on that year's principal.

yearly interest = principal × rate

*Hint: Deal with each year separately because in each year there will be a new balance or principal which includes all previous interest.*

**Q.** Luke invests \$2000 at a compound interest rate of 15% per year. After 3 years, how much does Luke have?

**A.**

$$2000 + \frac{15}{100} \times \frac{2000}{1} =$$

Year 1

$$= 2000 + 300 = 2300$$

$$2300 + \frac{15}{100} \times \frac{2300}{1} =$$

Year 2

$$= 2300 + 345 = 2645$$

$$2645 + \frac{15}{100} \times \frac{2645}{1} =$$

Year 3

$$= 2645 + 396.75 =$$

$$= \mathbf{\$3041.75}$$

Luke starts with \$2000.  
 After year 1: Principal is \$2000 plus 15% of \$2000 = \$2300  
 The next year's interest is paid on the new balance of \$2300.  
 After year 2: Principal is \$2300 plus 15% of \$2300 = \$2645  
 After year 3: Principal is \$2645 plus 15% of \$2645 = \$3041.75

**a)** What is the total amount of interest repaid on a loan of \$800 after 2 years at a compound interest rate of 6%?

Year 1

$$\frac{6}{100} \times \frac{800}{1} = 48$$

Interest after year 1

---


$$800 + 48 = 848$$

New principal after year 1

---

Year 2

$$\frac{6}{100} \times \frac{848}{1} = 50.88$$

Interest after year 2

---


$$Yr 1 + Yr 2 = 48 + 50.88 =$$

Total Interest after 2 years

**b)** The population of a city compounded annually at a rate of 10% per year. Initially 1000 people, what was the population after 2 years?

Year 1

.....

.....

Year 2

.....

.....

.....

**c)** April invests \$5000 at a compound interest rate of 20% per year. What is the total amount of interest April gets after 3 years?

Year 1

.....

.....

Year 2

.....

.....

.....

Year 3

.....

.....

.....

**d)** What is the total amount of interest repaid on a loan of \$12,000 after 3 years at a compound interest rate of 5%?

Year 1

.....

.....

Year 2

.....

.....

.....

Year 3

.....

.....

.....