

EXAM 1_3 (Percentages)

1) Round off: (1 point)

Number	to the hundredth	to the thousandth
3.18591		
-40.1795		
0.25476		
-1.01071		

2) Work out and simplify, writing the steps you have taken to reach the solution:

a) $\frac{4}{3} \div \frac{2}{3} + 2^{-2} - \frac{3}{4} \div \frac{3}{7} =$ (2 points)

b) $\left(\frac{1}{2} + 1\right)^2 \cdot \frac{1}{4} - \frac{3}{4} \cdot \left(\frac{1}{3} - \frac{1}{2}\right) =$

3) Write the following expression as a single positive power, writing the steps you have taken to reach the solution: (0.75 points)

$$\frac{4^{-2} \cdot 12^3 \cdot 8^2}{6^3 \cdot 2^{-2}} =$$

4) Complete: (1 point)

$\sqrt{-49} =$	$\sqrt{\quad} = -11$	$\sqrt[3]{-27} =$
$\sqrt{(-4)^2} =$	$\sqrt{4^2} =$	$\sqrt[4]{-16} =$

5) Calculate (first write the numbers in standard form and give the answer to 4 significant figures): (1.25 points)

a) $\frac{0.00375 \cdot 0.00067342}{57210000 \cdot 0.00234} =$

b) $(234560000 - 106730) \div (50000)^2 =$

c) $\sqrt{0.000000789} =$

6) Complete: (1.5 points)

Original amount	% increase/decrease	Final amount
900	12% ↑	
3520	25% ↓	
545		436
	15% ↑	989

7) Bob made a fresh pot of coffee in the morning. By 10:00 a.m. only 3 cups remained. If 85% of the coffee had been consumed, how many cups of coffee did Bob make in total? (1.25 points)

8) A computer whose regular price is €425 is marked down to €318.75. What is the percentage of discount? (1.25 points)

SOLUTION

1) Round off:

Number	to the hundredth	to the thousandth
3.18591	3.19	3.186
-40.1795	-40.18	-40.180
0.25476	0.25	0.255
-1.01071	-1.01	-1.011

2) Work out and simplify, writing the steps you have taken to reach the solution:

$$a) \frac{4}{3} \div \frac{2}{3} + 2^{-2} - \frac{3}{4} \div \frac{3}{7} = \frac{4 \cdot 3}{3 \cdot 2} + \frac{1}{2^2} - \frac{3 \cdot 7}{4 \cdot 3} = 2 + \frac{1}{4} - \frac{7}{4} = \frac{8+1-7}{4} = \frac{2}{4} = \frac{1}{2}$$

$$b) \left(\frac{1}{2} + 1\right)^2 \cdot \frac{1}{4} - \frac{3}{4} \cdot \left(\frac{1}{3} - \frac{1}{2}\right) = \left(\frac{1+2}{2}\right)^2 \cdot \frac{1}{4} - \frac{3}{4} \cdot \frac{2-3}{6} = \frac{9}{4} \cdot \frac{1}{4} - \frac{3}{4} \cdot \frac{-1}{6} = \frac{9}{16} + \frac{3}{24} = \frac{9}{16} + \frac{1}{8} = \frac{9+2}{16} = \frac{11}{16}$$

3) Write the following expression as a single positive power, writing the steps you have taken to reach the solution:

$$\frac{4^{-2} \cdot 12^3 \cdot 8^2}{6^3 \cdot 2^{-2}} = \frac{(2^2)^{-2} \cdot (2^2 \cdot 3)^3 \cdot (2^3)^2}{(2 \cdot 3)^3 \cdot 2^{-2}} = \frac{2^{-4} \cdot 2^6 \cdot 3^3 \cdot 2^6}{2^3 \cdot 3^3 \cdot 2^{-2}} = \frac{2^8}{2^1} = 2^7$$

4) Complete:

$\sqrt{-49} = \text{no existe}$	$\sqrt{121} = -11$	$\sqrt[3]{-27} = -3$
$\sqrt{(-4)^2} = \pm 4$	$\sqrt{4^2} = \pm 4$	$\sqrt[4]{-16} = \text{no existe}$

5) Calculate (first write the numbers in standard form and give the answer to 4 significant figures):

$$a) \frac{0.00375 \cdot 0.00067342}{57210000 \cdot 0.00234} = \frac{3.75 \cdot 10^{-3} \times 6.7342 \cdot 10^{-4}}{5.721 \cdot 10^7 \times 2.34 \cdot 10^{-3}} = 1.886 \cdot 10^{-11}$$

$$b) (234560000 - 106730) \div (50000)^2 = (2.3456 \cdot 10^8 - 1.0673 \cdot 10^5) \div (5 \cdot 10^4)^2 = 9.378 \cdot 10^{-2}$$

$$c) \sqrt{0.000000789} = \sqrt{7.89 \cdot 10^{-7}} = 8.883 \cdot 10^{-4}$$

6) Complete:

Original amount	% increase/decrease	Final amount
900	12 % ↑	1008
3520	25 % ↓	2640
545	20 % ↓	436
860	15 % ↑	989

7) Bob made a fresh pot of coffee in the morning. By 10:00 a.m. only 3 cups remained. If 85% of the coffee had been consumed, how many cups of coffee did Bob make in total?

$$\frac{15\%}{100\%} = \frac{3}{x} \Rightarrow 15x = 300 \Rightarrow x = \frac{300}{15} = 20$$

Bob made 20 cups of coffee

8) A computer whose regular price is €425 is marked down to €318.75. What is the percentage of discount?

$$\frac{x\%}{100\%} = \frac{318.75}{425} \Rightarrow x = \frac{31875}{425} = 75\%$$

$$100\% - 75\% = 25\%$$

Percentage of discount is 25%