Unit 5 Final Exam Review

1. Write each percent as a fraction and as a decimal.   a) 24.5%   b) $2\frac{4}{5}$%   c) 0.44%

a) $24.5\% = \frac{245}{1000} = \frac{49}{200} = 0.245$

b) $2\frac{4}{5}\% = 2.8\% = \frac{28}{1000} = \frac{7}{250} = 0.028$

c) $0.44\% = 0.0044 = \frac{44}{10000} = \frac{11}{2500}$

2. Write each fraction as a decimal and as a percent.   a) $\frac{5}{200}$ b) $\frac{28}{800}$ c) $\frac{9}{6}$

a) $\frac{5}{200} = 0.025 = 2.5\%$

b) $\frac{28}{800} = 0.035 = 3.5\%$

c) $\frac{9}{6} = 1.5 = 150\%$

3. The scale on a map is 1 cm represents 40 km. The actual straight line distance between 2 cities is about 340 km. What is the map distance between these 2 cities?

$\frac{340}{40} = 8.5$

$\times 8.5 \left\{ \begin{array}{c} 1\,cm : 40\,km \\ \underline{8.5\,cm : 340\,km} \end{array} \right\} \times 8.5$

The distance on the map would be 8.5 cm

4. Write each decimal as a fraction and as a percent.   a) 0.22   b) 0.003

a) $0.22 = \frac{22}{100} = \frac{11}{50} = 22\%$ b) $0.003 = \frac{3}{1000} = 0.3\%$

5. Elaine scored 19 out of 24 on her science test. Addison had 81.25% on the same test. Who did better?

Elaine $= \frac{19}{24} = 0.791\overline{6}$ Addison $= 81.25\%$

$= 79.1\overline{6}\%$

Addison did better.

6. During a school tournament, Team A had 10 of its 12 team members present. Team B had 13 of its 15 players present. Which team had the lesser percent of its team present at the tournament?

Team A $= \frac{10}{12} = 0.8\overline{3} = 83.\overline{3}\%$

Team B $= \frac{13}{15} = 0.8\overline{6} = 86.\overline{6}\%$

Team A had the lesser percent.

7. Write each percent as a decimal.   a) 275%   b) 0.25%

a) $275\% = 2.75$ b) $0.25\% = 0.0025$

8. Find each percent of the number.   a) 400% of 240   b) 0.4% of 240

a) 400% of 240   b) 0.4% of 240

$= 4.00 \times 240$ $= 0.004 \times 240$

$= 960$ $= 0.96$

9. 160 students attended Music Night on Thursday night. The attendance on Friday night was 120% of the attendance on Thursday night. The attendance on Saturday night was 75% of the attendance on Friday night. How many people attended Music Night on Friday night? Saturday night?

Friday   Saturday

120% of 160   75% of 192

$= 1.2 \times 160$ $= 0.75 \times 192$

$= 192$ $= 144$

On Friday night 192 people attended and on Saturday night 144 attended.

10. The courier travelled 508 km in 8 h. What was the average speed? At this rate, how long will it take the courier to travel 889 km?

$$\div 8 \Big(\begin{array}{l} 508 \text{ km} : 8\text{h} \\ 63.5 \text{ km} : 1\text{h} \end{array} \Big) \div 8 \qquad \frac{508}{8} = 63.5$$

$$\times 14 \Big(\begin{array}{l} \\ 889 \text{ km} : \underline{14\text{ h}} \end{array} \Big) \times 14 \qquad \frac{889}{63.5} = 14$$

The average speed was $\underline{63.5 \text{ km/hr}}$ and it would take $\underline{14 \text{ hours}}$ to travel 889 km.

11. In a 500-word assignment, the teacher noted that 1.2% of the words were incorrectly spelled. How many words were correctly spelled?

1.2% of 500 words

= 0.012 × 500

= 6   There were 6 words incorrectly spelled.

12. Find the number in each case.   **a)** 30% of a number is 12.   **b)** 150% of a number is 60.

a) 30% of a number is 12
$$0.30 \times n = 12$$
$$\frac{0.30n}{0.30} = \frac{12}{0.30}$$
$$n = 40$$

b) 150% of a number is 60.
$$1.5 \times n = 60$$
$$\frac{1.5n}{1.5} = \frac{60}{1.5}$$
$$n = 40$$

13. A blueprint for a cottage has a scale of 1:40. One room measures 3.4 m by 4.8 m. Calculate the dimensions of the room on the blueprint.   3.4m = 340 cm   4.8m = 480 cm

$$\div 8.5 \Big(\begin{array}{l} 1:40 \\ \underline{8.5} : 340 \end{array} \Big) \times 8.5 \qquad \frac{340}{40} =$$

$$\times 12 \Big(\begin{array}{l} 1:40 \\ \underline{12} : 480 \end{array} \Big) \times 12 \qquad \frac{480}{40} =$$

The dimensions on the blueprint are 8.5cm by 4.8cm.

14. What is the percent of increase or decrease.
   a) The price of gas increased from 93.9¢ to 99.9¢   **b)** The # of employees decreased from 6800 to 5200

a) $\% \uparrow = \dfrac{\text{change}}{\text{original}} \times 100$

$$= \frac{99.9 - 93.9}{93.9} \times 100$$

$$= \frac{6}{93.9} \times 100$$

$$\doteq 6.4\%$$

b) $\% \downarrow = \dfrac{\text{change}}{\text{original}} \times 100$

$$= \frac{6800 - 5200}{6800} \times 100$$

$$= \frac{1600}{6800} \times 100$$

$$\doteq 23.5\%$$

15. A printing machine produces labels. Four percent of the labels produced are defective. Suppose 372 labels were defective. How many labels are not defective?

$$4\% \text{ of } \underline{\quad} \text{ is } 372.$$

$$0.04 \times \underline{\quad} = 372$$

$$\frac{0.04\,n}{0.04} = \frac{372}{0.04}$$

$$n = 9300$$

There were 9300 labels which means the were 8928 that were not defective

$$\begin{array}{r} 9300 \\ -\ 372 \\ \hline 8928 \end{array}$$

16. A camera shop reduced the price of a digital camera by 10% at the end of the first week, by 20% at the end of the second week, and by a further 20% at the end of the third week. The original price of the camera was $625. Calculate the sale price after 3 weeks, include 13% sales tax.

1st week: 100% − 10% = 90%
90% of $625
0.90 × 625 = $562.50

2nd week: 100% − 20% = 80%
80% of $562.50
0.80 × 562.5 = $450

3rd week: 100% − 20% = 80%
80% of $450
0.80 × 450 = $360

including 13% tax: 100% + 13% = 113%
113% of $360
1.13 × 360 = $406.80

The sale price including tax is $406.80.

17. A furniture store offers two choices of discount on a sofa with a price of $1250, either a 15% discount or a $200 rebate. Which is the better deal for the customer? Justify your answer.

Discount:
15% of $1250
= 0.15 × 1250
= 187.50

The discount is less than the $200 rebate, so the rebate is the better deal.

18. There are 7 cows and 5 chickens in a farmer's field. Write the ratio of cows to all the animals in the field. Then write the ratio as a percent.

cows : all animals
7 : 12
$= \frac{7}{12} = 0.58\overline{3} = 58.\overline{3}\%$

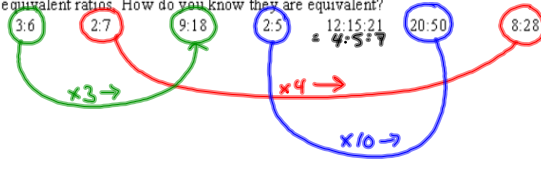19. A bag contains 4 strawberry, 3 grape, 2 orange, 5 raspberry, and 6 cherry gumballs. Write each ratio.
   i) strawberry:cherry   ii) orange and cherry:all gumballs   iii) raspberry:strawberry:cherry

i) 4 : 6   ÷2, ÷2
= 2 : 3

ii) 8 : 20   ÷4, ÷4
= 2 : 5

iii) 5 : 4 : 6

20. Write each ratio in simplest form.   **a)** 6:18   **b)** 16:12:20

a) $\div 6 \binom{6 : 18}{1 : 3} \div 6$

b) $\binom{16 : 12 : 20}{4 : 3 : 5} \div 4$

21. Find pairs of equivalent ratios. How do you know they are equivalent?

3:15:21   3:6   2:7   9:18   2:5   12:15:21   20:50   8:28   10:18
= 1:5:7   = 4:5:7   = 5:9

×3→   ×4→

×10→

22. Mr. James' class has a ratio of 2 boys to 3 girls. Ms. Singh's class has a ratio of 1 girl to 2 boys. Both classes have 30 students. How many boys and girls are in each class?

__Mr. James__

2 boys : 3 girls

__boys__   __girls__

$\binom{2:5}{12:30} \times 6$ $\binom{3:5}{18:30} \times 6$

12 boys and 18 girls

__Ms. Singh__

1 girl : 2 boys

__girls__   __boys__

$\binom{1:3}{10:30} \times 10$ $\binom{2:3}{20:30} \times 10$

10 girls and 20 boys.

23. Find the value of each variable.   **a)** $b:5 = 18:6$ **b)** $t:11 = 6:33$ **c)** $34:85 = f:5$

a) $b:5 = 18:6$

$\div 6 \binom{18 : 6}{3 : 1} \div 6$

$\times 5 \binom{3 : 1}{b : 5} \times 5$

$b = 15$

b) $t:11 = 6:33$

$\div 3 \binom{6:33}{2:11} \div 3$

$t:11$

$t = 2$

c) $34:85 = f:5$

$\div 17 \binom{34 : 85}{f : 5} \div 17$

$f = 2$

24. Express as a unit rate.   **a)** The bus travelled 80 km in 2 h.   **b)** Marco's heart beats 35 times in 30 s.

a) $\div 2 \binom{80\,km : 2h}{40\,km : 1\,h} \div 2$

40 km per 1 hour

b) $\times 2 \binom{35\,beats : 30\,s}{70\,beats : 60\,s} \times 2$

70 beats per 1 minute.

25. James read 48 pages in 90 min. How many pages could he read in 5 h?

48 pages : 90 min

$\div 1.5 \binom{48\,pages : 1.5\,hours}{32\,pages : 1\,hour} \div 1.5$

$\times 5 \binom{32\,pages : 1\,hour}{160\,pages : 5\,hours} \times 5$

James could read 160 pages in 5 hours.