# Gr. 9 Applied Math Review

## Integers:

**Adding and Subtracting Integers:** **REMEMBER - (-) = + and +(-) = -**

eg. (6) + (-3) =
(-2) + (10) =
(5) - (- 4) =
(-7) – (3) =

**Multiplying Integers:** ***If the signs are the same, the product is positive. If they're different, the answer is negative***

( + ) X ( + ) = ( + ) positive times a positive is **positive**
( - ) X ( + ) = ( - ) negative times a positive is **negative**
( + ) X ( - ) = ( - ) positive times a negative is **negative**
( - ) X ( - ) = ( + ) negative times a negative is **positive**

**Dividing Integers:** ***Same rules as multiplication (just check to see if the signs are the same or different)***

**1. Add**

a) (4) + (-2) = 2

b) (51) + (-41) = 10

c) (2) + (6) = 8

d) (-3) + ( 7) = 4

**2. Subtract**

a) (6) - (12) = -6

b) (5) - (-2) = 5+2 = 7

c) (-3) - (7) = -3-7 = -10

d) (-45) - (-45) = -45+45 = 0

**3. Multiply**

a) (5) X (9) = 45

b) (-4) X ( 7) = -28

c) (- 11) X (- 12) = 132

d) (12) X (-5) = -60

**4. Divide**

a) (25) ÷ (5) = 5

b) (-18) ÷ (3) = -6

c) (- 72) ÷ (- 8) = 9

d) (-35) ÷ ( 7) = -5

## Decimals:

Write in decimal form. eg. $\frac{3}{10}$ = 3 ÷ 10 = 0.3 (use a calculator if needed)

5 a) $\frac{24}{100}$ = 0.24

b) $\frac{12}{50}$ = 0.24

c) $\frac{2}{5}$ = 0.4

d) $\frac{9}{15}$ = 0.6

e) $\frac{3}{4}$ = 0.75

**Fractions:** $\frac{1}{4}$ - numerator
4 - denominator

**Reducing to lowest terms:** - find a common factor that will divide evenly into the top and into the bottom

eg. $\frac{5}{15} \div 5 = \frac{1}{3}$

**Reduce to lowest terms.**

6. a) $\frac{6}{12} \div 6 = \frac{1}{2}$

b) $\frac{9}{81} \div 9 = \frac{1}{9}$

c) $\frac{12}{36} \div 12 = \frac{1}{3}$

d) $\frac{8}{24} \div 8 = \frac{1}{3}$

**Adding or Subtracting Fractions:** When adding or subtracting fractions you need to have a common denominator.

eg. $\frac{1}{2}^{\times 3} + \frac{1}{3}^{\times 2} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

**Add or Subtract.**

8. a) $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$

b) $\frac{2}{5}^{\times 2} + \frac{1}{2}^{\times 5} = \frac{4}{10} + \frac{5}{10} = \frac{9}{10}$

c) $\frac{3}{5}^{\times 2} - \frac{1}{2}^{\times 5} = \frac{6}{10} - \frac{5}{10} = \frac{1}{10}$

d) $\frac{7}{8} - \frac{3}{4}^{\times 2} = \frac{7}{8} - \frac{6}{8} = \frac{1}{8}$

**Multiplying Fractions:** When multiplying fractions, multiply the numerators then multiply the denominators.

eg. $\frac{5}{6} \times \frac{4}{5} = \frac{20}{30} \div 10 = \frac{2}{3}$

--> When possible reduce to lowest terms

**Multiply.**

9. a) $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$

b) $\frac{2}{5} \times \frac{11}{21} = \frac{22}{105}$

c) $\frac{4}{15} \times \frac{5}{10} = \frac{20}{150} \div 10 = \frac{2}{15}$

**Dividing Fractions:** When dividing fractions change the sign to multiplication and invert the 2nd fraction

eg. $\frac{5}{6} \div \frac{1}{3} = \frac{5}{6} \times \frac{1}{3}$ -reduce to lowest terms

$= \frac{5}{18}$

**Divide.**

10. a) $\frac{1}{5} \div \frac{1}{5}$

$= \frac{1}{5} \times \frac{5}{1}$

$= \frac{5 \div 5}{5 \div 5}$

$= 1$

b) $\frac{2}{5} \div \frac{1}{2}$

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

$= \frac{4}{5}$

c) $\frac{4}{15} \div \frac{5}{7}$

$= \frac{4}{15} \times \frac{7}{5}$

$= \frac{28}{75}$

## Percent:

Percent means simply out of 100.
eg. If you received a mark of 80 on a test out of 100 you received a mark of 80%.

$\frac{80}{100} = 80\%$ $\frac{17}{100} = 17\%$

When you calculate percents from fractions that are not out of one hundred you divide the top (numerator) by the bottom (denominator), and multiply the decimal by 100.

Eg. $\frac{25}{50} = 0.5$ $\frac{24}{60} = 0.4$

$0.5 \times 100 = 50\%$ $0.4 \times 100 = 40\%$

Write as percents.

11. a) $\frac{6}{100}$

$= 6\%$

b) $\frac{7}{28}$

$= 0.25$

$\times 100$

$= 25\%$

c) $\frac{12}{25}$

$= 0.48$

$\times 100$

$= 48\%$

**Converting percents to decimals -** just divide the percent by 100 **OR** move the decimal 2 places to the left.

Eg. $25\% = 25 \div 100$
$= 0.25$

$42\% = 42 \div 100$
$= 0.42$

**Convert the percent to a decimal.**

12. a) 67% $= 0.67$

b) 3% $= 0.03$

c) 14% $= 0.14$

d) 6% $= 0.06$

**Converting a percent to a fraction:** - when converting a percent to a fraction use 100 as the denominator and if possible convert the fraction to lowest terms.

Eg. $50\% = \frac{50}{100} = \frac{50 \div 50}{100 \div 50} = \frac{1}{2}$

**Convert the percent to a fraction.**

13. a) 10%

$= \frac{10}{100} \overset{\div 10}{\underset{\div 10}{}}$

$= \frac{1}{10}$

b) 15%

$= \frac{15}{100} \overset{\div 5}{\underset{\div 5}{}}$

$= \frac{3}{20}$

c) 14%

$= \frac{14 \div 2}{100 \div 2}$

$= \frac{7}{50}$

d) 9%

$= \frac{9}{100}$

**Percent problems (*finding the percent OF a number*):**

Eg. 1 25% of 40 $= 0.25 \times 40$
$= 10$

**Convert the percent to a decimal and multiply**

Eg. 2 Skis are on sale at 40% off. A pair of skis regularly sells for $180. What is the price after the discount?

**Regular price** = $ 180 **Discount** 40 % of 180 = $0.40 \times 180$
$= 72$

**Sale Price** = $180 - 72$
$= \$108$

Therefore the price of the skis after discount is $108

**Percent Problems:**

14. a) 25% of 50

$= 0.25 \times 50$
$= 12.5$

b) 15% of 40

$= 0.15 \times 40$
$= 6$

c) 5% of 35

$= 0.05 \times 35$
$= 1.75$

d) 47% of 150

$= 0.47 \times 150$
$= 70.5$

(i) The regular price of a bike is $227.50. It is on sale at 15% off. What is the new sale price?

15% of 227.50
$= 0.15 \times 227.50$
$= 34.13$ discount

Sale price
$= 227.50 - 34.13$
$= \$193.37$

∴ The sale price is $193.37

***Can you think of another way to solve this problem?***

85% of the price remains

∴ 85% of 227.50 is the discount price

$0.85 \times 227.50$
$= \$193.38$