

PRE-ADMISSION TESTING SAMPLE QUESTIONS – TECHNICAL MATH

Topic 1: Fractions

- 1) Reduce $\frac{9}{36}$
- 2) Convert this fraction into a mixed number in lowest terms $\frac{60}{25}$
- 3) Find the Least Common Denominator of $\frac{1}{3}, \frac{1}{15}, \frac{1}{9}$
- 4) Two pins measure $\frac{3}{6}$ and $\frac{4}{9}$
 - a) What is the length of the larger pin?
 - b) What is the length difference between the two pins?
- 5) Add the fractions and bring your answer to lowest terms $\frac{1}{5} + \frac{1}{10} + \frac{1}{6}$
- 6) Add $2\frac{1}{2} + \frac{1}{4} + \frac{1}{5}$
- 7) Add $4\frac{1}{3} - 1\frac{1}{7}$
- 8) Multiply $4\frac{2}{9} \times 1\frac{1}{6}$
- 9) Divide $3\frac{1}{2} \div 1\frac{2}{3}$
- 10) Simplify $\frac{9\frac{3}{4} + \frac{1}{5}}{\frac{5}{8}}$
- 11) Find the value of x given $\frac{x}{23} = \frac{15}{3}$

Topic 2: Decimals

- 1) Divide 1.3289 by 0.431 and round to three decimal places
- 2) Convert $158\frac{3}{5}$ to a decimal. Round to one decimal place.
- 3) Convert 11.78 to a mixed fraction
- 4) Evaluate $2,300 + 3.13 + 1.09$. Round to one decimal place.
- 5) Evaluate $1.35 - 26.491 + 11.7$. Round to three decimal places.
- 6) Evaluate $0.6 \times 12.34 \times 1.4$. Round to two decimal places.
- 7) Divide 1.113 by 0.56. Round to three decimal places
- 8) Determine the volume of an aquarium with these definitions:
Length = 78 cm; Width = 6 cm; Height = 43 cm
- 9) Bob makes \$888.87 per week before deductions. The following deductions are made from his paycheque: Income Tax \$124.00; Company Pension \$42.86; C.P.P. \$38.97; and Dental Plan = \$31.97.
What are his total Deductions? What is his take-home pay?
- 10) Determine how much change you would get from \$100 if you purchased 31.9 litres of gas at a cost of 96.7 cents per litre.

Topic 3: Percents

1) Express the following as percents:

Decimal	Percent
a) 0.62	
b) 3.312	
c) 13	

2) Express the following percents as decimals:

Percent	Decimal
a) 79 %	
b) 317.2 %	
c) $14\frac{1}{3}$ %	

3) Express the following fractions as percents:

Fraction	Percent
a) $\frac{887}{962}$	
b) $\frac{14}{100}$	
c) $7\frac{7}{14}$	

4) Express the following percents in fractional form in lowest terms:

Percent %	Fraction Form
a) 86 %	
b) 52 %	
c) $7\frac{1}{2}$ %	

5) Determine $89\frac{1}{2}$ % of \$ 3,633 rounded to the nearest cent.

6) 316 kg is 15% of what measurement?

7) Helmer Co. Produces 1,090 DVD's per year. If 1.4% of these are defective, how many defective DVD's are produced per year? Round your answer to the nearest whole number.

8) Mohawk Digital Centre sells webcams for \$120 each. In an attempt to increase profit they increased the price by \$5.81. Express this increase as a percent of the original price.

9) Mohawk Digital Centre sells digital cameras for \$390.45 each. In an attempt to increase sales they reduced the price by 2%. What is the new price after the reduction?

Topic 4: Order of Operations

1) Evaluate the expression to two decimal places:

$$5 + 5 - 8 + 4 \div 6$$

2) Evaluate the expression to two decimal places:

$$(2 \div 6 \times 5)^2 \div 5 - 6$$

3) Evaluate the expression to two decimal places:

$$6 - [8 - (2 + 9 \times 3)]$$

4) Evaluate the expression to two decimal places:

$$4^2 - \{9^3 + [1^3 - (4 + 3)]\}$$

5) The formula to obtain the area of a certain shape is:

$$Area = \frac{L}{2} (w + d - t)$$

Determine the area when:

$$L = 18 \text{ m}; t = 2.3 \text{ m}; w = 4.6 \text{ m}; d = 10.1 \text{ m}$$

6) Calculate the future value of S of an annuity using the following formula:

$$S = R \left[\frac{(1 + i)^n - 1}{i} \right]$$

$$\text{Given: } R = \$250; i = 0.01; n = 13$$

7) Calculate the Book Value B using the following formula:

$$B = P - \left[\frac{5m(2n - 0.75m)}{n^3 - 2} \right] (P - S)$$

$$\text{Given: } P = \$151,788; m = 9; n = 11; S = \$35,000$$

Topic 5: Laws of Signs

1) Simplify: $- [+ (- 19)]$

2) Simplify: $- [- (- 234)]$

3) True or False? $| - 88 | = | 88 |$

4) True or False? $-96 > -105$

5) Evaluate: $7 + \frac{1}{-3} + 4\frac{1}{6}$

6) Evaluate:

$$\left(7\frac{1}{3} \right) \left(\frac{3}{-4} \right) \div (-2)$$

7) A person leaves the bus terminal and goes 15 blocks WEST for coffee. Next, he goes 2 blocks EAST to mail a letter and then 5 blocks WEST to visit a friend. Upon leaving his friend's house he is struck by a car and an ambulance takes him 9 blocks EAST to the hospital. Determine the direction and number of blocks he must travel from the hospital to make it back to the bus terminal.

Topic 6: Exponents

Enter your answer in fraction form:

1) Evaluate:

$$\left(\frac{2}{8}\right)^2$$

2) Evaluate:

$$(5^2)^2$$

3) Evaluate:

$$(4x)^{-3}; 4x^{-3}; 4(x)^{-3}$$

4) Evaluate:

$$-4A^2(3AB^3 + 4A^4B + 6A^{-5}B^4)$$

5) Simplify:

$$\left(\frac{2}{3}x^2\right)(15x^2 - 9)$$

6) Simplify: $\frac{17x^7y^9}{30x^1y}$

Simplify: $(2x^7y^4)^3$

8) Simplify: $\frac{3y(3x + y^2)^{19}}{10x(3x + y^2)^3}$

9) Simplify and eliminate all negative exponents: $\frac{6x^{-2}y^4}{12x^4y^{-4}}$

10) Simplify and eliminate all negative exponents: $4(x^{-7}y^2)^{-3}$

Topic 7: Basic Algebra

1) Perform the indicated operations and simplify:

$$3a - 3b - 27a + 9b$$

2) Simplify. Round the coefficient part of your answer to four decimal places:

$$\frac{3x}{2} + 4x - x$$

3) Perform the indicated operations and simplify:

$$5x - 3[(11x - 5) - (x - 2)]$$

4) Perform the indicated operations and simplify:

$$13x - (x - 3y) - [2x - (x - y)]$$

5) Perform the indicated operations and simplify:

$$(x^2 - xy - 5y^2) - (19x^2 - 7xy - y^2)$$

6) Expand and Simplify:

$$(3a - 5b)^2$$

7) Perform the indicated operation(s) and simplify:

$$18xy(3x^2)$$

8) Perform the indicated operations and simplify:

$$(x - 24)(3x^2 - 3x - 4)$$

9) Perform the indicated operations and simplify:

$$23(x + y)(4y)(y^4)$$

10) Perform the indicated operations and simplify:

$$\frac{240a^2b - 60ab + 105ab^2}{30ab}$$

Topic 8: Equations

1) Solve for B in fraction form: $4B + 15 = 100$

2) Solve for x: $ad = 12ax + 25$

3) Solve for x in fraction form: $\frac{2}{3}x + 16 = 19$

4) Solve for E in fraction form: $7E + 3(8 - 4E) = -20$

5) Solve for y: $V = \frac{t}{7}(x + y)$

6) Solve for x: $\frac{3x - 1}{2} = \frac{1}{2} + \frac{2x - 1}{2} + 1$

7) Solve for R: $D = \sqrt{\frac{R - r}{R + r}}$

8) A formula used for gear calculation is:

$$S = T - \frac{1.299}{N}$$

a. Solve for N

b. Calculate the value of N when S = 49 and T = 60

9) A formula used in pipe calculation is: $A = \frac{M}{P}(P + t)$

a. On a piece of paper, re-write this formula and solve for t, the pipe thickness.

b. Determine the value of t when A = 48.31, M = 16.12 and P = 3.55

Answer Sheet – Technical Math

Topic 1: Fractions

- 1) $\frac{1}{4}$
- 2) $2\frac{2}{5}$
- 3) 45
- 4) $\frac{1}{2}, \frac{1}{18}$
- 5) $\frac{7}{15}$
- 6) $2\frac{19}{20}$
- 7) $3\frac{4}{21}$
- 8) $4\frac{25}{27}$
- 9) $2\frac{1}{10}$
- 10) $15\frac{23}{25}$
- 11) 115

Topic 2: Decimals

- 1) 3.083
- 2) 158.6
- 3) $11\frac{39}{50}$
- 4) 2,304.2
- 5) -13.441
- 6) 10.37
- 7) 1.988
- 8) 20,124 cm³
- 9) \$237.80 ; \$651.07
- 10) \$69.15

Topic 3: Percents

1)

- a. 62 %
- b. 331.2 %
- c. 1,300 %

2)

- a. 0.79
- b. 3.172
- c. 0.143

3)

- a. 92.2%
- b. 14%
- c. 750%

4)

a. $\frac{43}{50}$

b. $\frac{13}{25}$

c. $\frac{3}{40}$

5) \$3251.54

6) 2,106.67 kg

7) 15

8) 4.84%

9) \$382.64

Topic 4: Order of Operations

- 1) 2.67
- 2) -5.44
- 3) 27
- 4) -707
- 5) 111.6 m²
- 6) \$3452.33
- 7) \$91482.68

Topic 5: Laws of Signs

1. 19
2. -234
3. True
4. True
5. $10\frac{5}{6}$
6. $2\frac{3}{4}$
7. 9 Blocks in the East Direction

Topic 6: Exponents

- 1) 1/16
- 2) 625
- 3) $\frac{1}{64x^3}; \frac{4}{x^3}; \frac{4}{x^3}$
- 4) $-12A^3B^3 -16A^6B -24A^{-3}B^4$
- 5) $10x^4 - 6x^2$
- 6) $\frac{17x^6y^8}{30}$
- 7) $8x^{21}y^{12}$
- 8) $\frac{3y(3x+y^2)^{16}}{10x}$

9) $\frac{1y^8}{2x^6}$

10) $\frac{4x^{21}}{y^6}$

Topic 7: Basic Algebra

1) $-24a + 6b$

2) $4.5x$

3) $-25x + 9$

4) $11x + 2y$

5) $-18x^2 + 6xy - 4y^2$

6) $9a^2 - 30ab + 25b^2$

7) $54x^3y$

8) $3x^3 - 75x^2 + 68x + 96$

9) $92xy^5 + 92y^6$

10) $\frac{16a - 4 + 7b}{2}$

Topic 8: Equations

1) $B = \frac{85}{4}$

2) $x = \frac{ad - 25}{12a}$ or $x = \frac{d}{12} - \frac{25}{12a}$

3) $x = \frac{9}{2}$

4) $E = \frac{44}{5}$

5) $y = \frac{7V}{t} - x$ OR $y = \frac{7V - tx}{t}$

6) $x = \frac{1.5}{0.5} = 3$

7) $\frac{-r(1+D^2)}{(D^2-1)}$ or $\frac{-r-D^2r}{(D^2-1)}$

8) a. $N = -\frac{1.299}{(S-T)}$;

b. 0.118

9) a. $t = \frac{AP}{M} - P$;

b. $t = 7.09$