

Name: _____
Student ID: _____

Test 1

This test is graded out of 45 marks. No books, notes, graphing calculators or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. (4 marks) Simplify the following expressing your final answer with positive exponents only:

$$\left(\frac{-2x^2y^{-3}z^{11}}{y^2z^{-3}} \right)^{-2} \frac{3y^{-2}}{-2z^0}$$

Question 2. (4 marks) Solve for x . Express your answer as a fraction:

$$\frac{4x-1}{3} = \frac{x-3(2-x)}{2}$$

Question 3. (4 marks) Solve for y:

$$\frac{1}{x} = \frac{2}{y} + \frac{3}{z}$$

Question 4. (7 marks) Find the equation of the line passing through the point (3,3) and perpendicular to the line $3 = 6x + 2y$. Sketch the graph of both lines.

Question 5. (2 marks each) Find the exact values of the following (no decimals or rounding).

a. $\tan 135^\circ$

b. $\sec \frac{7\pi}{6}$

Question 6. (4 marks) Solve the triangle with sides $a = 2.0$, $b = 3.0$ and $c = 4.0$ (round your angles to two significant figures)

Question 7. (3 marks each) (use the correct number of significant figures)

- a. Convert $235\text{ N} \cdot \text{m}$ (Newton metres) to $\text{ft} \cdot \text{lbs}$ (foot pounds).
- b. Convert $33.3 \frac{\text{N}}{\text{dm}^2}$ (Newton per square decimetres) to Pa (Pascals).

Question 8. (1 mark each)

- a. Find an angle between 0 and 2π that is coterminal with the angle $\frac{13\pi}{5}$.
- b. Convert $34^\circ 11' 44''$ to decimal degree notation.
- c. Convert 35.9832° to degree minute second notation.
- d. Find the quadrant in which the terminal point determined by t lies, if $\sin(t) < 0$ and $\sec(t) < 0$.
- e. Convert 200° in radians.
- f. Convert $\frac{4\pi}{8}$ in degrees.
- g. Are 197° and -377° co-terminal angles.

Question 9. (5 marks) (use the correct number of significant figures)

In Yann's most recent trip, he must bike to the top of Rohtang Pass. Since Yann does not trust the author of his guide book, he wants to determine the height of the pass himself. Good thing he brought on his trip with him: a quadrant (to measure the *angle of elevation* from the horizon) and a GPS which displays his current elevation and total distance traveled.

The town of Manali is at an altitude of 1950. *m*. Before leaving Manali Yann measures the angle of elevation to the top of Rohtang Pass which reads 6.6° . He bikes on a straight road with constant slope, 8.00 *km* later he arrives in the town of Palchan at an altitude of 2250. *m* where he again measures the angle of elevation to the top of Rohtang Pass which reads 10.3° . What is the height of Rohtang Pass?

Bonus Question. (1 mark)

Did Yann really bring a quadrant in his latest travels?