

## Algebra pre-test

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This diagnostics test has being designed for students who will be taking the Pure Mathematics 1 course. Questions are based on the Algebra II text book in use in Florida, USA.

Student's name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Degrees Celsius and degrees Fahrenheit are related by the following equation:

$$C = \frac{5}{9}(F - 32)$$

Give the expression of F, degrees Fahrenheit, as a function of C, degrees Celsius.

2. Write the equation of the line, in each of the following cases:

- (a) the slope or gradient of the line is 3, and it contains point (1,5).
- (b) the line has slope or gradient equal to zero and intercept the  $y$ -axis at  $y = -2$ .

3. Given the equation of the line  $3x + 5y = 12$ :

- (a) Graph the line in a rectangular coordinate system,
- (b) Calculate and label the x-intercept and the y-intercept.

4. Find the solution(s) to the following equations:

- (a)  $-3(2x - 5) + \geq 4$
- (b)  $|3x - 4| + 5 \leq 27$
- (c)  $4x^2 + 10 = 46$
- (d)  $x^2 - x - 6 = 0$

5. Use polynomial long division to divide  $6x^2 + 7x + 2$  by  $2x + 1$ .

6. Expand:

- (a)  $(3x + y)^2$
- (b)  $(x + 5)^3$
- (d)  $x^3 + y^3$

7. Solve the following quadratic inequality  $(x - 5)(x + 2) \leq 0$  by graphing the inequality in a rectangular coordinate system. Shade the area containing all of the points that make the inequality true.

8. A rectangular swimming pool is 2 m deep. One side of the pool is 2.5 times longer than the other. The amount of water needed to fill the pool is  $11256 m^3$ . Find the dimensions of the pool.