

## MAT 141 Precalculus

## Self-Assessment of Readiness

*Last update: Fall 2024*

Students who plan to take MAT 141, some skills they are expected to know before entering the class are listed below.

1. Express  $\frac{5}{x} - \frac{3}{x-2}$  as a single fraction.
2. Find an equation of the line passing through the points  $(2, -6)$  and  $(5, -12)$ .
3. Simplify the expression  $\frac{\sqrt{x} \cdot x^2}{x^4}$  and express the answer with positive exponents.
4. What is the exact value of  $\sin 60^\circ$ ?
5. Solve  $3x^2 - 5x + 1 = 0$  for  $x$ .
6. Solve for  $x$ :  $5 = ax + xy$ .
7. If  $f(x) = x^2$  then what is  $f(x+h)$ ?
8. Remove the parentheses and simplify the expression  $9a^2 - [7a^2 - 12a - (a^2 - 3a)]$ .
9. Factor completely:  $3x^3 + 27x^2 - 156x$ .
10. Factor completely:  $x^4 - 2bx^2 + b^2$ .

**Answers**

1.  $\frac{2x - 10}{x^2 - 2x}$

2.  $y = -2x - 2$

3.  $\frac{1}{x^{\frac{3}{2}}}$

4.  $\frac{\sqrt{3}}{2}$

5.  $x = \frac{5 \pm \sqrt{13}}{6}$

6.  $x = \frac{5}{a + y}$

7.  $f(x + h) = x^2 + 2xh + h^2$

8.  $3a^2 + 9a$

9.  $3x(x + 13)(x - 4)$

10.  $(x^2 - b)^2$