

MA104 Final Exam Practice

1. Solve the following triangle: $A = 65^\circ, B = 15^\circ, C = 100^\circ$
2. Solve the following triangle: $A = 25^\circ, b = 10, c = 0^\circ$
3. Solve the following triangle: $a = 8, b = 12, A = 40^\circ$
4. **Solve the equation for x**

$$9(x + 4) + \sqrt{5} = 5(x - 1) - \sqrt{45}$$

5. Your grade in this class is computed by the expression

$$G = \frac{H}{4} + \frac{E1 + E2 + E3}{6} + \frac{E4}{4}$$

where H is your homework average, $E1, E2, E3$ are your exam grades and $E4$ represents your grade on the final.

If your homework grade is an 80, your exam grades are 70, 75, and 81, what must you make on the final to earn a 75 or better?

6. Simplifying Expressions

Simplify the expression

$$\left(\frac{a^3 y^5 b^6 x^{-4} y^{-1}}{x^4 y^3 x^4 b^6 a^5} \right)^{-3}$$

into the form $a^r b^s x^t y^u$.

7. Solving Equations

If possible, solve the equation for x . If no solutions exist, indicate the reason.

$$\frac{x}{x-2} + \frac{1}{x+2} = -4$$

8. Sketch of the graph of $y = x^3 + 5x^2 - 6x$, then answer the following questions.

(a) The x -intercepts are: $x_1 =$ _____, $x_2 =$ _____, $x_3 =$ _____
with $x_1 \leq x_2 \leq x_3$.

(b) The y -intercept is _____.

9. **Write an equation of the line which**

A) passes through $(-1,3)$ and $(7,-6)$

B) is perpendicular to the line $y = -8x + 1$ and passes through $(2,4)$.

10. **Solve for x** , and give your answer in interval notation.

$$\frac{x^2 - 2x - 6}{x + 5} \leq -2$$

11. **Solve for x**

$$\sqrt{x} + 10 = x$$

12. **Solve for x** .

$$x^3 + x^2(x^3 - 1) = 1$$

13. **Evaluate functions.** Suppose $f(x) = -x^2$ and $g(x) = \sqrt{x}$
Compute

$$f(0) = \underline{\hspace{10em}}$$

$$f(4) = \underline{\hspace{10em}}$$

$$(f \circ g)(x) = \underline{\hspace{10em}}$$

$$(f \circ f)(x) = \underline{\hspace{10em}}$$

14. The half-life of the prescription drug Adderall is about 10 hours. Using the APERT formula, derive a model for the amount of Adderall in the human body t hours after ingesting 30mg of the drug

If someone takes a 30mg dose at midnight, how much Adderall is in their bloodstream at 8a.m.?

15. Solve for x if $\ln(8^x) = 3$.

16. A plane is flying at an elevation of 32000 feet. It is within sight of the airport and the pilot finds that the angle of depression to the airport is 21° .

Find the distance between the plane and the airport.

Find the distance between a point on the ground directly below the plane and the airport.

17. Suppose a person's energy can be measured on a scale from 0 to 100. Assume that for $t \in [1, 120]$, $f(t) = \frac{100}{t}$ gives the energy level of a student during a mathematics exam as a function minutes, t , after the exam began.

What is the meaning of $f(120)$ in the context of this problem?

What does the slope between the points $(1, 100)$ and $(2, 50)$ describe?

Do you think this model accurately describes your energy level?