Mathematics Practice Exam

Total: 50 points

Important Notes- READ BEFORE ANSWERING THE EXAM

• If you perceive any ambiguity in any of the questions, state your assumptions clearly and solve the problem based on your assumptions. We will grade both your solutions and your assumptions.
• This exam is take-home.
• You have 60 minutes to complete this exam.
• You are allowed only one submission.
• Your answers must be very focused. You may be penalized for wrong answers and for putting irrelevant information in your answers.

Section 1: Multiple Choice (10 points)

Instructions: Choose the best answer for each multiple choice question. Each question is worth 2 points.

1. What is the derivative of $f(x) = 3x^2 + 2x - 5$?

a) $6x + 2$
b) $3x + 2$
c) $6x^2 + 2$
d) $6x^2 + 2x - 5$

Answer: _____

2. Solve for x: $2x + 5 = 11$

a) $x = 8$
b) $x = 3$
c) $x = 6$
d) $x = 16/2$

Answer: _____

3. What is the area of a circle with a radius of 5 cm? (Use < $, 2ã B•

a) 15.7 cm^2
b) 31.4 cm^2
c) 78.5 cm^2
d) 157 cm^2

Answer: _____

4. Simplify the expression: $3(x + 2) - 2(x - 1)$

a) $5x + 8$
b) $x + 8$
c) $x + 4$
d) $5x + 4$

Answer: _____

5. What is the value of sin(30°)?

a) 1/2
b) " 3/2

c) 1

d) " 2/2

Answer: _____

Section 2: Short Answer (20 points)

Instructions: Answer the following questions concisely and to the point. Each question is worth 5 points.

1. Explain the difference between a prime number and a composite number. Give an example of each.

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_____

2. Solve the quadratic equation: $x^2 - 4x + 3 = 0$

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3. What is the Pythagorean Theorem? Write the formula and explain what each variable represents.

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4. Find the slope of the line passing through the points (2, 5) and (4, 9).

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Section 3: Problem Solving (20 points)

Instructions: Solve the following problems and show your work clearly. Each problem is worth 10 points.

1. A rectangular garden has a length of 12 meters and a width of 8 meters. What is the perimeter and the area of the garden?

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_____

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2. A car travels at a constant speed of 60 km/h for 3 hours. How far does the car travel? Then, if the car's speed decreases by 10 km/h, how long would it take the car to travel the same distance?

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