

1. There are 11 problems on the exam
2. No graphing or programmable calculators are allowed. Scientific calculators are allowed but are not needed.
3. Give exact answers (fractions, square roots, etc.). Decimal approximations may not receive full credit.
4. Please do not simplify unless explicitly told so. Answers such as $x = \frac{3^3\sqrt{25} + 6}{4}$ are okay. Answers such as $3x+4=7x-2$ require more simplification.
5. No notes or books are allowed.
6. Use only the scratch paper provided.
7. Show your work and make your methods clear. Unjustified answers will receive no credit.
8. For each problem put your final answer inside the box.

No.	Points		Score
1	10		
2	10		
3	10		
4	10		
5	6		
6	6		
7	10		
8	10		
9	6		
10	10		
11	12		
	100	TOTAL POINTS	

1. (10 points)

Set an equation to find the sum of the first hundred terms of a geometric sequence where the second term is $a_2 = 3$ and the common ratio is $r = \frac{1}{2}$.

LEAVE THE EXPRESSION SO THAT IT CAN BE EVALUATED WITH A CALCULATOR, BUT YOU DO NOT NEED TO EVALUATE THE EXPRESSION.

ans

2. (10 points) Solve the inequality. Write the answer in interval notation.

$$\frac{x^2 - 8x - 9}{x} < 0$$

ans

3. (10 points) Find all real solutions of the equation $4x^4 + 3x^2 - 1 = 0$

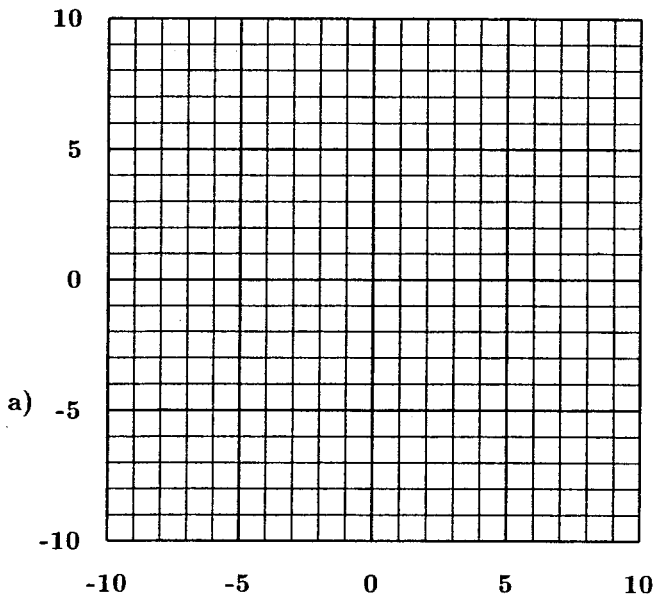
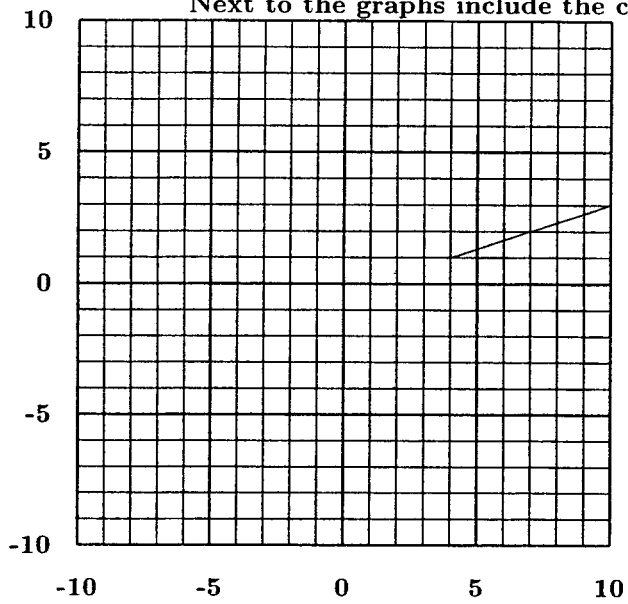
ans

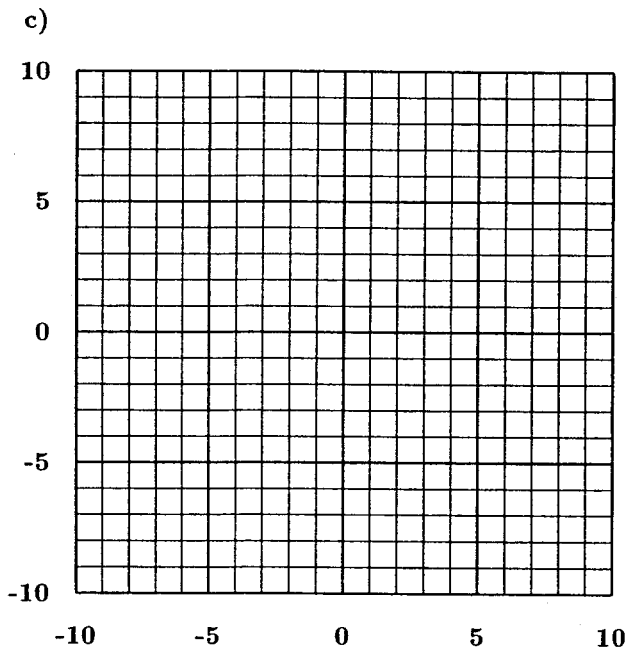
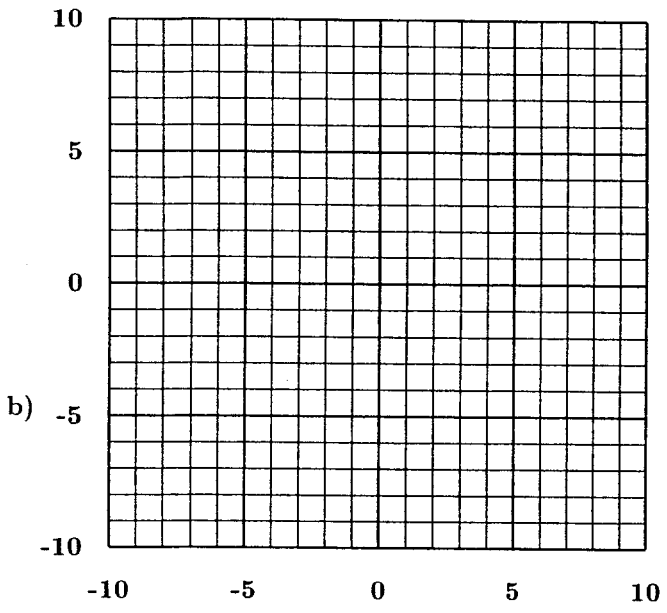
4. (10 points) Find the equation of the line tangent to the circle $x^2 + y^2 = 25$ at the point $(-3, 4)$. Write your answer in slope-intercept form.

<p>ans</p>

5. (6 points) The endpoints of a line segment \overline{AB} are $A(4,1)$ and $B(10,3)$ as shown in the first graph below. Use the following three graph papers to sketch the reflection of \overline{AB} about
- y-axis
 - x-axis
 - origin

Next to the graphs include the coordinates of the end points.





6. (6 points)

Rewrite the sum using sigma notation.

$$\frac{1}{10} + \frac{2}{10^2} + \frac{3}{10^3} + \frac{4}{10^4} + \dots + \frac{49}{10^{49}}$$

<p>ans</p>

7. (10 points) The points $P(-4, 3)$ and $Q(8, 7)$ are the endpoints of a diameter of a circle. Find the equation of the circle passing through these points.

ans

8. (10 points) Sally runs 2 mph faster than Pat throughout a 4 mile race. If Sally finishes 6 minutes ahead of Pat, what was Sally's time for the race? Write your answer in minutes.

ans

9. (6 points) Solve for r in terms of h . Simplify as much as possible.

$$2\pi r^2 + 2\pi r h = 20\pi$$

ans

10. (10 points) Solve the inequality and specify the answer using interval notation.

$$\left| \frac{2x - 3}{4} \right| \leq 4$$

<p>ans</p>

11. (4 points each)

For the following problems simplify as much as possible. (Give an exact answer using radicals, not a decimal approximation.)

a) Perform the indicated operations and simplify as much as possible.

$$4\sqrt{24} - 8\sqrt{54} + \sqrt{6}$$

ans

b) Carry out the indicated operation and simplify as much as possible.

$$\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

ans

c) Rewrite the expression using rational exponents instead of radicals.

$$\sqrt{\sqrt[3]{x}\sqrt[4]{y}}$$

ans

SCRATCH

