BRONX COMMUNITY COLLEGE of the City University of New York

## DEPARTMENT OF MATHEMATICS \& COMPUTER SCIENCE

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Directions: You must show all your work in the provided space for full credit. Simplify your answer whenever possible. Be certain to indicate your final answers clearly. Each problem is worth 4 points.

1. Evaluate:
(a) $2-\frac{5}{6}$
(b) $2(-3)^{2}-7$
(c) $\frac{1}{2}-\left(\frac{1}{3}-\frac{1}{2}\right)$
2. Evaluate the expression $-5 x^{2}+2 x+18$ for $x=-2$.
3. Solve for $x$ : $\quad-2(4+x)=5(x+2)+3$
4. Solve for $x$ : $\quad 3 x-7 t-4=20$
5. Solve: $2 x-3 \geq 7 x+7$ and (a) graph the solution set,

6. Sketch the graph of $-2 x+4 y=-16$. Show the $x$ and $y$ intercepts.

7. Suppose $(1,4)$ and $(4,-2)$ are points on a straight line.
a) Find the slope of the line through these points.
b) Find an equation for the line through these points.
8. What is the value of the $y$ coordinate: $\left\{\begin{array}{l}3 x+5 y=1 \\ 2 x-3 y=-1\end{array}\right.$
9. Write in Scientific Notation: (a) $13 \times 10^{-8} \times 9 \times 10^{13}$
(b) $\frac{452 \times 10^{-2}}{10000 \times 10^{-7}}$
10. Subtract $-7 x^{3}+4 x^{2}-10 x+8$ from $-8 x^{3}+8 x^{2}+12 x-10$.
11. Simplify: $\frac{-16 x^{5}+4 x^{3}+24 x^{2}}{-4 x^{2}}$
12. Factor completely: (a)20x $x^{2} y-5 x y^{2} \quad$ (b) $3 x^{2}-7 x-6 \quad$ (c) $8 y^{2}-50$
13. The sides of a right triangle are $a=10$ and $b=15$. Find the length of the hypothenuse.
14. From the equations below, find two equations representing parallel lines and two equations representing perperdicular lines:
(a) $3 x-4 y=10$
(b) $3 x+4 y=10$
(c) $4 x-3 y=5$
(d) $4 y-3 x=5$
15. Simplify the radicals: $\quad$ (i) $\frac{\sqrt{2} \sqrt{36}}{\sqrt{6}} \quad$ (ii) $-3 \sqrt{12}+\sqrt{300}-2 \sqrt{48}$
16. Multiply and simplify:
(i) $\left(-2 x+1\left(4 x^{2}-2 x+5\right)\right.$ $(i i)(2 x-3)^{2}$
17. If $n$ represents a number, what is the correct translation for the sentence: " 65 is 17 less than 7 times the number".
18. Find all solutions of the equation: $\quad-24 x^{2}=-6$
19. If the price of an item goes up from $\$ 70$ to $\$ 75$. What was the percent of increase? Write your answer as a mixed number.
20. Find the equation of the verticall line passing through the point $(-4,5)$.
21. Facto completelyr: $\quad 4 x^{3}-8 x^{2}-x+2$.
22. Simplify: $\frac{-4\left(x^{4} y^{-2}\right)^{2}}{2 x^{3} y^{-9}}$.
23. Find all solutions to the quadratic equation: $\quad x^{2}-x=12$
24. Sketch the region determined by the inequality $-3 x+5 y \geq-15$.

25. If the cost of 6 pounds of a product is $\$ 14$. What is the cost of 8 pounds? Write your answer as a mixed number.
