Math 111I-006 Basic College Mathematics

Practice Exam #1
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Name: _____

Answer the following questions. *You must show your work to receive full credit.* Be sure to make reasonable simplifications. Give exact answers. Indicate your final answer with a box.

Factor completely. Indicate if prime.

1. $18x^9y^7 + 90x^7y^5 - 72x^3y^3$

2. $m^2(n-14) - (n-14)$

3. $15x^2 + 8y^2 - 10xy - 12xy$

4. $121k^2 + 16m^2$

5. $3x^2 - 3x - 18$

6. $6y^2 + 17y + 12$

7. $x^2 - x - 56$

8. $x^4 + 7x^2 + 12$

9. $49x^2 - 16$

10. $216p^3 - 1$

11. $64x^3 + 1$

12. $z^2 + 10z + 25$

13. $x^3 + 4x^2 - 9x - 36$

14. $25x^2 + 16$

Simplify using exponent rules.

15. $x^{5/4}x^{11/4}$

16. $(4a^{5/6})^4$

17. $\left(\frac{9}{k^2}\right)^{-1/2}$

18. $\sqrt[5]{27u^3v^2}\sqrt[5]{9u^12v^3}$

Perform the indicated operation and simplify.

19. $\frac{k^2+15k+54}{k^2+12k+27} \cdot \frac{k^2+8k+15}{k^2+11k+30}$

20. $\dfrac{k^2+7k+10}{k^2+14k+45} \div \dfrac{k^2+6k+8}{k^2+9k}$

21. $\dfrac{2}{y^2-3y+2} + \dfrac{6}{y^2-1}$

22. $\dfrac{6}{x+3} - \dfrac{2}{x-3}$

Solve the quadratic equation by factoring.

23. $\dfrac{7x^2 - 18}{3} = -13x$

24. $5x^2 - 30x + 40 = 0$

Solve the quadratic equation using any method learned in class.

25. $\frac{1}{2}x^2 - x - 2 = 0$

26. $x^2 + 5x + 1 = 0$

27. $3x^2 + 6x - 1 = 0$

Solve the inequality. Write your solution in interval notation and graph on the real number line.

28. $3x - 5 > 1$

29. $1 - 3x \leq -5$

30. $2x + 8 \leq 7x + 43$

31. $3 < 2x - 3 \leq 11$

32. $x^2 - 5x - 24 \leq 0$

33. $x^2 \leq 64$

34. Let $P(3,7)$ and $Q(-2,1)$ be two points in the coordinate plane.
    (a) Find the distance between P and Q.

    (b) Find the midpoint between P and Q.

35. A taxi service in NYC charges a flat fee of $10.00 plus .75$ per mile. Find an equation that models the total cost C for travelling x miles. How much would it cost to travel from Times Square to LaGuardia Airport (10 miles)?