Math 007: Test 2 (October 11, 2006) Name: _____

[/58] Answer all questions on looseleaf. *Show all your work!* Scientific (non-graphing) calculators are permitted. Use proper mathematical notation and clearly indicate your final answer.

[marks] Hand in the question sheet along with your answers.

For questions 1 to 8: Perform any indicated operations, and simplify.

[2 each]

1. $(3+x)(2x^2-5x-1)$
2. $7xy(x^2-3xy-4y^2)$
3. $(-ab^3c^2)^3(2a^5b)$
4. $(4x^3+6x-6)+(9x^2-7x+4)$
5. $\dfrac{(-2x^3y)^4}{8x^2y^5}$
6. $\dfrac{15a^2b^2-5a-20a^3b}{5ab}$
7. $(x+8)(4x-1)$
8. $(3x-4)^2$

Solve by long division:

[2] 9. $(2x^3-6x-36)\div(x-3)$

Change from scientific notation into standard notation, or vice versa:

[1 each]

10. 9.58×10^{-5}
11. $50\,000\,000$

For questions 12 to 23: Factor completely, if possible.

[2 each]

12. $4ab^2-a$
13. $x^2-12x-28$
14. $6y^2-17y+7$
15. $2x^2+20x+13$
16. $a^3-3a^2b+3ab^2-9b^3$
17. $18a^3-54a^2+36a$
18. $12m^5n^4+27m^3n^6$
19. $x^2+8x-128$
20. $6x^2-x-15$
21. $4x^4+12x^3-128x^2$
22. x^8-y^8
23. $4a^2-44a+121$

For questions 24 to 25: Solve for x.

[3 each]

24. $x^2+7x=18$
25. $x(x-9)=-20$

[4] 26. The length of a rectangular flower bed is 5 metres more than its width. Its area is 36 m^2. What are its dimensions? (Hint: the area of a rectangle equals length times width. Draw a picture.)

[4] 27.
(a) Factor 90 into its prime factors.
(b) Factor 600 into its prime factors.
(c) What is the greatest common factor of 90 and 600?
(d) What is the least common multiple of 90 and 600?

Bonus question (up to 4 bonus points): Solve for x.

$$90x^2+557x+600=0$$

Answers:
1) $2x^3 + x^2 - 16x - 3$
2) $7x^3y - 21x^2y^2 - 28xy^3$
3) $-2a^8b^10c^6$
4) $4x^3 + 9x^2 - x - 2$
5) $\frac{2x^{10}}{y}$
6) $3ab - \frac{1}{b} - 4a^2$
7) $4x^2 - 24x + 16$
8) $9x^2 - 24x + 16$
9) $2x^2 + 6x + 12$ (remainder 0)
10) 0.0000958
11) 5×10^7
12) $a(2b + 1)(2b - 1)$
13) $(x - 14)(x + 2)$
14) $(2y - 1)(3y - 7)$
15) Does not factor
16) $(a - 3b)(a^2 + 3b^2)$
17) $18a(a - 2)(a - 1)$
18) $3m^3n^4(4m^2 + 9n^2)$
19) $(x + 16)(x - 8)$
20) $(3x - 5)(2x + 3)$
21) $4x^2(x^2 + 3x - 32)$
22) $(x^4 + y^4)(x^2 + y^2)(x + y)(x - y)$
23) $(2a - 11)(2a - 11)$ (or $(2a - 11)^2$)
24) $x = -9$, $x = 2$
25) $x = 5$, $x = 4$
26) The bed is 4 m by 9 m.
27) a) $90 = 2 \times 3 \times 3 \times 5$ b) $600 = 2 \times 2 \times 2 \times 3 \times 5 \times 5$
c) GCF: 30 d) LCM: 1800
Bonus question:
The trinomial factors into: $(18x + 25)(5x + 24) = 0$ giving $x = \frac{-25}{18}$, $x = \frac{-24}{5}$.