College Algebra w.B.A. — Joysheet 1
MAT 120, Spring 2014 — D. Ivanšić

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Show all your work!

1. (4pts) Evaluate.

$$\frac{\sqrt{36}+4\cdot(-3)}{7-4/\sqrt{4}} = \frac{6-12}{7-4/2} = \frac{-6}{7-2} = -\frac{6}{5}$$

2. (8pts) Simplify and write in standard form:

a) $(x-7)(2x+1)-2x(x-4) = 2x^2+x-14x-7-(2x^2-8x)$

$= 2x^2-13x-7-2x^2+8x = -5x-7$

b) $(x^2+1)(3x^2-5x+1) = 3x^4-5x^3+x^2+3x^2-5x+1$

$= 3x^4-5x^3+4x^2-5x+1$

3. (3pts) Write a polynomial of degree 4 whose leading coefficient is -7, constant term is 3, and has at least three terms.

For example, $-7x^4+4x^3-5x^2+6x+3$

4. (10pts) The Hacks Company makes axes. Its fixed costs are \$56,000, and the variable cost of producing x thousand axes are $-2x^2+4580x$. Suppose the company can sell the axes for \$10.98 a piece.
a) Find the expressions for revenue, cost and profit when selling x thousand axes.
b) Fill out the profit table for the indicated values of x.

x	P
5	−23,950
10	8,200
30	137,800
50	269,000
110	672,200

a) $R = 10.98\cdot 1000x = 10{,}980x$

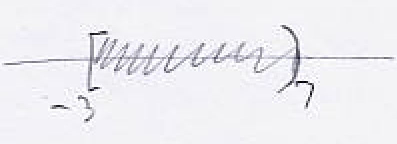
$C = -2x^2+4580x+56000$

$P = R-C = 10{,}980x-(-2x^2+4{,}580x+56000)$

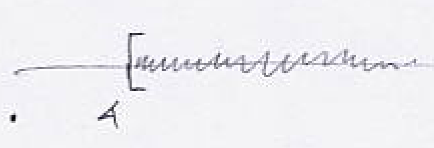
$= 2x^2+6{,}400x-56{,}000$

5. (6pts) Draw the sets described by the inequality on the real line and write them in interval notation.

$-3 \le x < 7$ $\quad [-3,7)$



$x \ge 4$ $\quad [4,\infty)$



Factor the following. Use either a known formula or a factoring method.

6. (2pts) $4x^4 - 10x^2 =$ $2x^2(2x^2 - 5)$

7. (4pts) $x^2 - x - 20 =$ $(x-5)(x+4)$

prod $= -20$ $\quad -5, 4$
sum $= -1$

8. (5pts) $6x^2 + 7x - 10 =$ $6x^2 + 12x - 5x - 10 = 6x(x+2) - 5(x+2)$

$= (6x-5)(x+2)$

prod $= -60$ | $12, -5$
sum $= 7$ | ✓

9. (5pts) $4x^2 - 28xy + 49y^2 =$ $(2x)^2 - 2 \cdot 2x \cdot 7y + (7y)^2$

$= (2x - 7y)^2$

10. (3pts) $64u^2 - 9w^2 =$ $(8u)^2 - (3w)^2 = (8u - 3w)(8u + 3w)$

11. (6pts) $125u^3 - 8v^3 =$ $(5u)^3 - (2v)^3 = (5u - 2v)((5u)^2 + 5u \cdot 2v + (2v)^2)$

$= (5u - 2v)(25u^2 + 10uv + 4v^2)$

12. (4pts) Write the absolute value expressions without absolute value:

$|2u - 4v|$, if we know that $2u - 4v \geq 0$

$2u - 4v$

since $2u - 4v$ is positive

$|3x - 5y|$, if we know that $3x - 5y < 0$

$-(3x - 5y)$ since $3x - 5y$ is negative

$= 5y - 3x$