Answer Sheet

1	$(x+7)(x-2)$	16	$9x^2-4$
2	$(x-4)(x-3)$	17	$-4x+20$
3	$(x-8)(x+4)$	18	$2x^3-14x^2+27x-35$
4	$(x+5)(x+5)$	19	$x-1\ \frac{2}{x-4}$
5	$(x+2)(x^2+5)$	20	x^2-2x+4
6	$(x+6)(x^2-4)$	21	x^9
7	$(3x-1)(3x+5)$	22	$27x^3y^6$
8	$(2x-3)(2x+5)$	23	$5x^2$
9	$4x^4-7x^3-2x^2$	24	$\frac{6x^3}{y^4}$
10	$2x^4+3x^3+4x^2$	25	$\frac{25x^2}{y^6}$
11	$\frac{4}{3}x-\frac{21}{5}$	26	$\frac{y}{x^4}$
12	$-\frac{2}{3}x-\frac{19}{5}$	27	$\frac{1}{9}$
13	$2x^3-8x$	28	$\frac{1}{64}$
14	$x^2-8x+16$	29	$1\ 6x^5y$
15	$2x^2-x-15$	30	$6x^5y$

East Los Angeles College
Department of Mathematics
Math 115
Test 4

Solutions

Factor the following polynomials.

1. $x^2 + 5x - 14$

2. $x^2 - 7x + 12$

3. $x^2 - 4x - 32$

4. $x^2 + 13x + 40$

Factor by grouping

5. $x^3 + 2x^2 + 5x + 10$

6. $x^3 + 6x^2 - 4x - 24$

7. $9x^2 - 3x + 15x - 5$

8. $4x^2 - 6x + 10x - 15$

Add or Subtract the following polynomials

9. $(3x^4 - 2x^3 + x^2) + (x^4 - 5x^3 - 3x^2)$

10. $(3x^4 - 2x^3 + x^2) - (x^4 - 5x^3 - 3x^2)$

11. $\left(\frac{1}{3}x - 4\right) + \left(x - \frac{1}{5}\right)$

12. $\left(\frac{1}{3}x - 4\right) - \left(x - \frac{1}{5}\right)$

Multiply the following polynomials

13. $2x(x^2 - 4x)$

14. $(x - 4)^2$

15. $(x - 3)(2x + 5)$

16. $(3x - 2)(3x + 2)$

17. $-4(x - 5)$

18. $(x - 5)(2x^2 - 4x + 7)$

Divide the following polynomials

19. $\frac{x^2-5x+6}{x-4}$

20. $\frac{x^3+8}{x+2}$

Use properties of Exponents to simplify and write with positive powers

21. $x^2x^3x^4$

22. $(3xy^2)^3$

23. $\frac{25x^4y}{5x^2y}$

24. $\frac{12xy^{-3}}{2x^{-2}y}$

25. $(5xy^{-3})^2$

26. $\frac{x^{-3}y^2}{xy}$

27. $3^{-4}3^2$

28. $\frac{4^{-1}}{4^2}$

29. $4325xyzw^0$

30. $(-3x^4y^{-2})(-2xy^3)$

Math US Test 3

(1) $x^2 + 5x - 14$

product $= -14$

sum $= 5$

7, -2

$(x+7)(x-2)$

(2) $x^2 - 7x + 12$

product $= 12$

sum $= -7$

$-4, -3$

$(x-4)(x-3)$

(3) $x^2 - 4x - 32$

product $= -32$

sum $= -4$

$-8, 4$

$(x-8)(x+4)$

(4) $x^2 + 13x + 40$

product $= 40$

sum $= 13$

$8, 5$

$(x+8)(x+5)$

(5) $x^3 + 2x^2 + 5x + 10$

$x^2(x+2) + 5(x+2)$

$(x+2)(x^2+5)$

(6) $x^3 + 6x^2 - 4x - 24$

$x^2(x+6) - 4(x+6)$

$(x+6)(x^2-4)$

(7) $9x^2 - 3x + 15x - 5$

$3x(3x-1) + 5(3x-1)$

$(3x-1)(3x+5)$

(8) $4x^2 - 6x + 10x - 15$

$2x(2x-3) + 5(2x-3)$

$(2x-3)(2x+5)$

(9) $3x^4 - 2x^3 + x^2$
$+ x^4 - 5x^3 - 3x^2$

$4x^4 - 7x^3 - 2x^2$

(10) $3x^4 - 2x^3 + x^2$
$-x^4 + 5x^3 + 3x^2$

$2x^4 + 3x^3 + 4x^2$

(11) $\frac{1}{3}x - 4 + x - \frac{1}{5}$

$\left(\frac{1}{3} + 1\right)x - \frac{4}{1} - \frac{1}{5}$

$\left(\frac{1}{3} + \frac{3}{3}\right)x - \frac{4 \cdot 5}{1 \cdot 5} - \frac{1}{5}$

$\boxed{\frac{4}{3}x - \frac{21}{5}} - \frac{20}{5} - \frac{1}{5}$

(12) $\left(\frac{1}{3}x - 4\right) - \left(x - \frac{1}{5}\right)$

$\frac{1}{3}x - 4 - x + \frac{1}{5}$

$\frac{1}{3}x - x - 4 + \frac{1}{5}$

$\left(\frac{1}{3} - 1\right)x - 4 + \frac{1}{5}$

$\left(\frac{1}{3} - \frac{3}{3}\right)x - \frac{4 \cdot 5}{5} + \frac{1}{5}$

$-\frac{2}{3}x - \frac{20}{5} + \frac{1}{5}$

$\boxed{-\frac{2}{3}x - \frac{19}{5}}$

(13) $2x(x^2 - 4x)$

$2x \cdot x^2 - 2x \cdot 4x$

$\boxed{2x^3 - 8x}$

(14) $(x-4)^2 = (x-4)(x-4)$

	x	-4
x	x^2	$-4x$
-4	$-4x$	16

$\boxed{x^2 - 8x + 16}$

(15) $(x-3)(2x+5)$

	$2x$	5
x	$2x^2$	$5x$
-3	$-6x$	-15

$\boxed{2x^2 - x - 15}$

(16) $(3x-2)(3x+2)$

	$3x$	2
$3x$	$9x^2$	$6x$
-2	$-6x$	-4

$$9x^2 - 4$$

(17) $-4(x-5) = -4x + 20$

(18) $(x-5)(2x^2 - 4x + 7)$

	$2x^2$	$-4x$	7
x	$2x^3$	$-4x^2$	$7x$
-5	$-10x^2$	$20x$	-35

$$2x^3 - 14x^2 + 27x - 35$$

(19)

$$\begin{array}{r} x-1 \\ x-4 \overline{)\, x^2 - 5x + 6} \\ -x^2 + 4x \\ \hline -x + 6 \\ +x - 4 \\ \hline 2 \end{array}$$

$$x-1 \ \frac{2}{x-4}$$

(20)

$$x+2 \;\overline{)\; x^3 + 0x^2 + 0x + 8}$$

$$x^2 - 2x + 4$$

$-x^3 + 2x^2$

$-2x^2 + 0x$

$+2x^2 + 4x$

$4x + 8$

$-4x + 8$

0

(21) $x^2 \cdot x^3 \cdot x^4$

x^{2+3+4}

$\boxed{x^9}$

(22) $(3xy^2)^3$

$3^3 x^3 y^6$

$\boxed{27x^3y^6}$

(23) $\dfrac{5}{\cancel{25}\, x^4 y}{\cancel{5}\, x^2 y}$

$5x^{4-2} y^{1-1}$

$5x^2 y^0$

$\boxed{5x^2}$

(24) $\dfrac{12xy^{-3}}{2x^{-2} y^1}$

$6x^{1--2} y^{-3-1}$

$6x^{1+2} y^{-4}$

$6x^3 y^{-4}$

$\boxed{\dfrac{6x^3}{y^4}}$

(25) $(5xy^{-3})^2 = 5^2 x^2 y^{-6}$

$$\boxed{\frac{25x^2}{y^6}}$$

(26) $\frac{x^{-3}y^2}{xy} = x^{-3-1}y^{2-1}$

$x^{-4}y^1 \qquad \frac{y^1}{x^4}$

$$\boxed{\frac{y}{x^4}}$$

(27) $3^{-4}3^2 = 3^{-4+2} = 3^{-2} = \frac{1}{3^2}$

$$= \boxed{\frac{1}{9}}$$

(28) $\frac{4^{-1}}{4^2} = 4^{-1-2} = 4^{-3} = \frac{1}{4^3}$

$$\boxed{\frac{1}{64}}$$

(29) $\boxed{1}$

(30) $(-3x^4y^{-2})(-2xy^3)$

$= 6x^4 \cdot x y^{-2} y^3$

$= 6x^5y^1 \quad \boxed{6x^5y}$