Practice Problems - Lecture 2a

Problem 1. Determine whether the following statements are true or false:
(a) $|6-8| = |6| - |8|$;
(b) $|(-3)^3| = -|3^3|$;
(c) $|-5| \cdot |6| = |-5 \cdot 6|$;
(d) if $a < 0$, then $|a| = -a$.

Problem 2. Find the distance between the points (a) -4 and -1; (b) -1 and 12.

Problem 3. Write the following without absolute value signs:
(a) $|e-2| + |e-5|$;
(b) $|10 + 2x|$.

Problem 4. Simplify:
(a) $(5x^2y)(-3x^3y^4)$;
(b) $(-2x^5y^0)^5$;
(c) $\left(\dfrac{-5n^4}{r^2}\right)^3$.

Problem 5. Identify whether each expression is a polynomial; if it is, state its degree and classify it as a monomial, binomial, or trinomial:
(a) $-9y + 5y^3$;
(b) $-9t^4 + 8t^3 - 7$;
(c) $\dfrac{3}{8}x^5 - \dfrac{1}{x^2} + 9$;
(d) 2.

Problem 6. Find the sum or difference:
(a) $(3m^3 - 3m^2 + 4) + (-2m^3 - m^2 + 6)$;
(b) $-(8x^3 + x - 3) + (2x^3 + x^2) - (4x^2 + 3x - 1)$;
(c) $2(3r^2 + 4r + 2) - 3(-r^2 + 4r - 5)$.

Problem 7. Find the product: $(3w + 2)(-w^2 + 4w - 3)$.

Answers:

1. (a) False; (b) False; (c) True; (d) True.
2. (a) 3; (b) 13.
3. (a) 3; (b) $|10 + 2x| = 10 + 2x$ if $x \geq -5$, $|10 + 2x| = -10 - 2x$ if $x < -5$.
4. (a) $-15x^5y^5$; (b) $-32x^{25}$; (c) $\dfrac{-125n^{12}}{r^6}$.
5. (a) Yes, degree 3, binomial; (b) Yes, degree 4, trinomial; (c) No; (d) Yes, degree 0, monomial.
6. (a) $m^3 - 4m^2 + 10$; (b) $-6x^3 - 3x^2 - 4x + 4$; (c) $9r^2 - 4r + 19$.
7. $-3w^3 + 10w^2 - w - 6$.