

Midchapter 3 review

Date _____ Period _____

Simplify each expression.

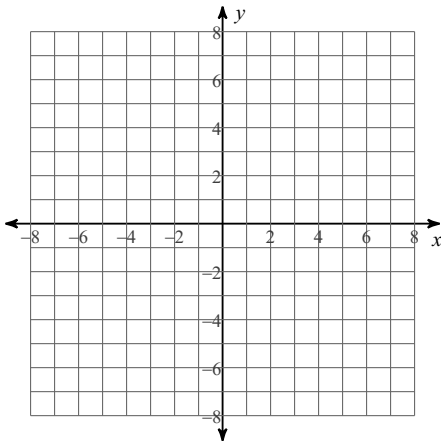
1) $(4n^2 + 8n^3 - 1) + (3n^3 + 7n^2 - 3)$

2) $(3x^2 + 2x + 8x^4) - (6x^4 + 6x^2 - x)$

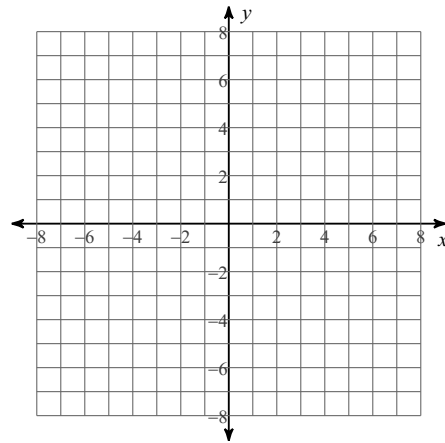
3) $(3b^3 - 8b^4 - b^2) + (5b^4 + b^3 - 8b^2)$

Sketch the graph of each function.

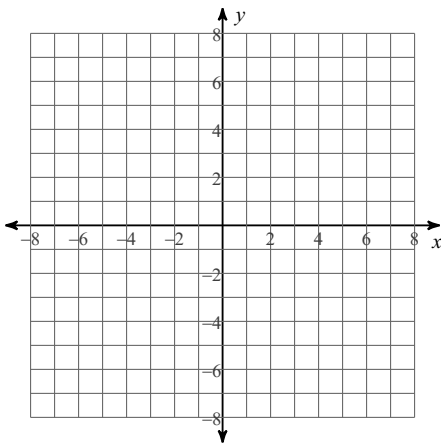
4) $f(x) = -x^3 + 4x^2 - 5$



5) $f(x) = -x^4 + 4x^2 + x - 4$



6) $f(x) = x^4 - 3x^2 + 3x + 1$

**Put each polynomial in standard form, Name each polynomial, and state the leading coefficient.**

7) $4x^2 - x^3 - 7x^5$

8) $-4r - 9r^2 - 7r^3 - 6$

9) $9x + 4$

10) $10x$

Find each product.

11) $(3m^2 + 5m - 7)(-3m - 4)$

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

Factor each.

13) $x^3 + 10x^2 + 25x = 0$

14) $x^3 - 2x^2 + 4x - 8 = 0$

15) $x^3 + 1 = 0$

16) $x^4 - x^2 - 12 = 0$

Divide. 17&19 use long division, 18 and 20 use Synthetic division

17) $(10p^3 - 58p^2 + 41p - 14) \div (p - 5)$

18) $(r^3 + 3r^2 - 24r + 26) \div (r + 7)$

19) $(a^3 - 2a^2 - 74a + 48) \div (a + 8)$

20) $(a^3 + a^2) \div (a + 1)$

Simplify. Your answer should contain only positive exponents.

21) $\frac{(-2y^3)^2}{2y^2}$

22) $\frac{(-y^2)^2}{x^{-3}y^4 \cdot x^{-2}y^3}$

23) $\left(-\frac{x^4y^{-3} \cdot 2x^{-4}}{2x^{-1}y^0}\right)^{-1}$

24) $\frac{yx^3}{(2xy^3)^2}$

25) $\frac{(2x^0y^4)^0 \cdot -x^{-3}}{-2x^2}$

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

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Simplify each expression.

$$1) (4n^2 + 8n^3 - 1) + (3n^3 + 7n^2 - 3)$$

$$11n^3 + 11n^2 - 4$$

$$3) (3b^3 - 8b^4 - b^2) + (5b^4 + b^3 - 8b^2)$$

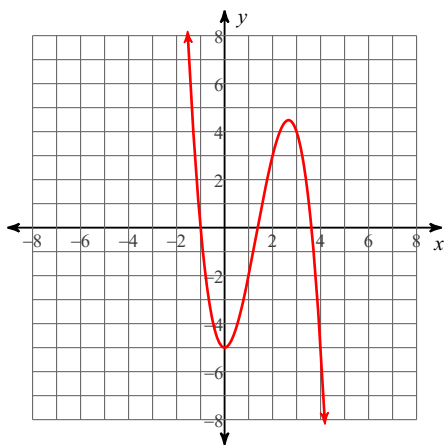
$$-3b^4 + 4b^3 - 9b^2$$

$$2) (3x^2 + 2x + 8x^4) - (6x^4 + 6x^2 - x)$$

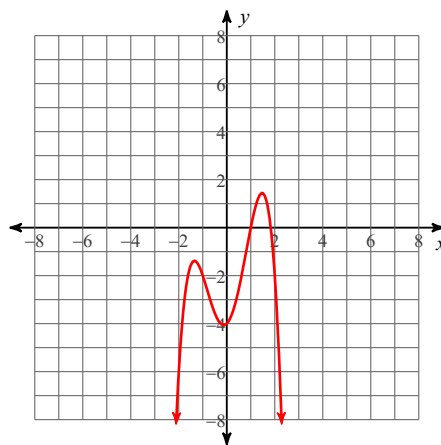
$$2x^4 - 3x^2 + 3x$$

Sketch the graph of each function.

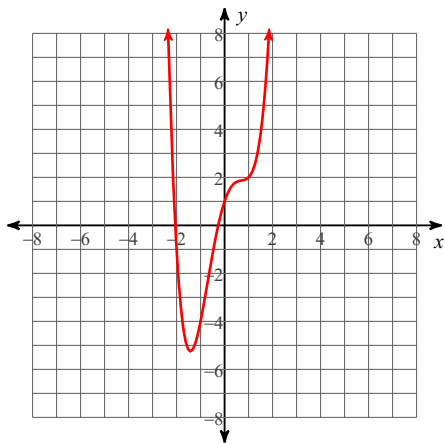
$$4) f(x) = -x^3 + 4x^2 - 5$$



$$5) f(x) = -x^4 + 4x^2 + x - 4$$



$$6) f(x) = x^4 - 3x^2 + 3x + 1$$

**Put each polynomial in standard form, Name each polynomial, and state the leading coefficient.**

$$7) 4x^2 - x^3 - 7x^5$$

$$\text{fifth degree trinomial } -7x^5 - x^3 + 4x^2$$

$$8) -4r - 9r^2 - 7r^3 - 6$$

$$\text{cubic polynomial with four terms } -7r^3 - 9r^2 - 4r - 6$$

$$9) 9x + 4$$

$$\text{linear binomial } 9x + 4$$

$$10) 10x$$

$$\text{linear monomial}$$

Find each product.

$$11) (3m^2 + 5m - 7)(-3m - 4)$$
$$-9m^3 - 27m^2 + m + 28$$

$$12) (x-3)(x+2)(x-5)$$
$$x^3 - 6x^2 - x + 30$$

Factor each.

$$13) x^3 + 10x^2 + 25x = 0$$
$$x(x + 5)^2 = 0$$

$$14) x^3 - 2x^2 + 4x - 8 = 0$$
$$(x - 2)(x^2 + 4) = 0$$

$$15) x^3 + 1 = 0$$
$$(x + 1)(x^2 - x + 1) = 0$$

$$16) x^4 - x^2 - 12 = 0$$
$$(x^2 + 3)(x - 2)(x + 2)$$

Divide. 17&19 use long division, 18 and 20 use Synthetic division

$$17) (10p^3 - 58p^2 + 41p - 14) \div (p - 5)$$
$$10p^2 - 8p + 1 - \frac{9}{p - 5}$$

$$18) (r^3 + 3r^2 - 24r + 26) \div (r + 7)$$
$$r^2 - 4r + 4 - \frac{2}{r + 7}$$

$$19) (a^3 - 2a^2 - 74a + 48) \div (a + 8)$$
$$a^2 - 10a + 6$$

$$20) (a^3 + a^2) \div (a + 1)$$
$$a^2$$

Simplify. Your answer should contain only positive exponents.

$$21) \frac{(-2y^3)^2}{2y^2}$$
$$2x^{14}y^6$$

$$22) \frac{(-y^2)^2}{x^{-3}y^4 \cdot x^{-2}y^3} \cdot \frac{x^5}{y^3}$$

$$23) \left(-\frac{x^4y^{-3} \cdot 2x^{-4}}{2x^{-1}y^0} \right)^{-1} - \frac{y^3}{x}$$

$$24) \frac{yx^3}{(2xy^3)^2} \cdot \frac{x}{4y^5}$$

$$25) \frac{(2x^0y^4)^0 \cdot -x^{-3}}{-2x^2} \cdot \frac{1}{2x^5}$$

$$26) \frac{2x^2y^{-1} \cdot 2x^{-3}}{(xy^2)^{-2}}$$
$$4xy^3$$