

HIGH SCHOOL

ALGEBRA

ENRICHMENT PACKET

Enrichment Packet

Write each Polynomial in standard form. Then identify its degree, its leading coefficient, its constant, and classify the type of polynomial.

1) $4x + 8x^3 - 4$

2) $-6b^6$

3) $4x^4$

4) $2m^6$

5) $-n + 8$

6) -9

Simplify each expression.

7) $(3 + x^3 - 7x^4) + (4x^3 + 8x + 4x^4)$

8) $(7n^3 + 3 + 8n^2) + (2n^3 + 3 - 6n)$

9) $(7n - 4n^3 - 6n^2) - (n - 5n^2 + 6n^4)$

10) $(x + 1 - x^2) - (8 - 4x - 2x^2)$

11) $(8 - 8m^2 + 2m^3) - (6m^2 + m^3 + 3m^4)$

12) $(3 - 8n - 7n^4) + (4 + 5n^4 + 6n)$

13) $(7 + 7k^3 + 2k^4) - (8 + 3k^3 - k^4)$

14) $(4n^2 - 4n^3 - 4n) + (n^3 + 6n - 3n^2)$

15) $(1 + m^2 - 7m^4) - (2m^4 + 2 + m^2)$

16) $(3p^4 - 2p^3 + p) + (4p^3 + 8p + 5)$

Find each product.

17) $4(2b^2 + 4b - 4)$

18) $5x(x^2 + 5x - 6)$

19) $8(3m^2 + 8m - 2)$

20) $7m^5(2m^2 - 2m - 3)$

21) $(5n - 8)(2n + 8)$

22) $(2k - 4)(8k + 7)$

23) $(7x + 7)(x + 7)$

24) $(6x + 8)(x - 2)$

25) $(4a + 5)(4a + 4)$

26) $(8x - 6)(2x + 5)$

27) $(5b + 6)(7b^2 - 5b - 1)$

28) $(7a - 8)(4a^2 - 5a + 3)$

29) $(8m + 3)(7m^2 + 3m + 5)$

30) $(6x + 1)(4x^2 - 4x - 5)$

31) $(8p + 4)(7p^2 + 2p + 3)$

32) $(3m - 2)(8m^2 - 2m + 1)$

Simplify. Your answer should contain only positive exponents.

33) $y^2 \cdot 4x^4y^2$

34) $x^2 \cdot x^2y^2$

$$35) 4x^4y^4 \cdot 4y^2$$

$$36) xy \cdot 3xy$$

$$37) 3xy^3 \cdot x^3y^2$$

$$38) 4yx^2 \cdot 4xy^2$$

$$39) 4y^2 \cdot 2x^4y^3 \cdot 4x$$

$$40) 3u^3v^4 \cdot 4u^3v^2$$

$$41) (y^4)^4$$

$$42) (4yx^2)^2$$

$$43) (x^2)^4$$

$$44) (2m^2n^2)^2$$

$$45) (3nm^4)^3$$

$$46) (4mn^3)^3$$

$$47) \frac{4x^4}{3y}$$

$$48) \frac{2vu^3}{2u^4v^4}$$

$$49) \frac{3xy^4}{4yx^4}$$

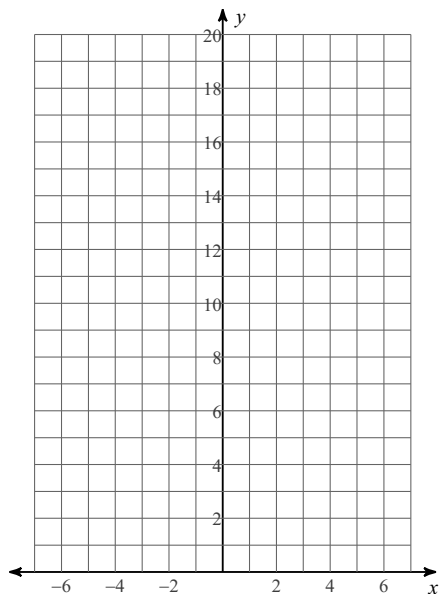
$$50) \frac{3xy^4}{xy^4}$$

$$51) \frac{4n}{3mn^3}$$

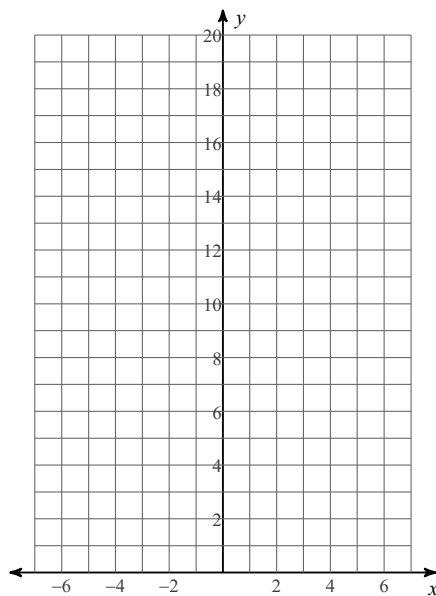
$$52) \frac{3yx^4}{2yx^4}$$

Sketch the graph of each function.

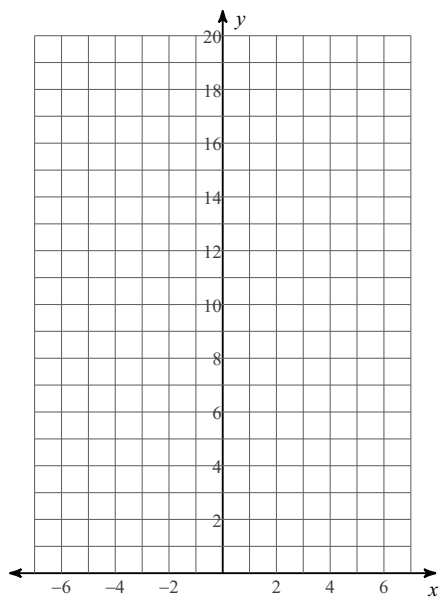
53) $y = \frac{1}{4} \cdot 2^x$



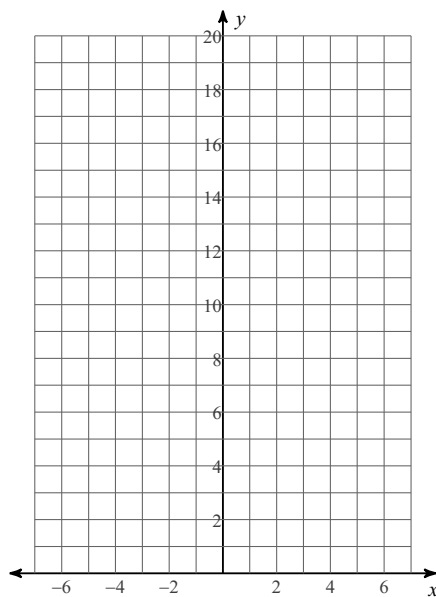
54) $y = 5 \cdot 2^x$



55) $y = \frac{1}{4} \cdot 8^x$



56) $y = 2 \cdot \left(\frac{1}{2}\right)^x$



Solve each equation.

57) $|3k - 4| = 25$

58) $|1 + 7x| = 57$

59) $|10k - 4| = 44$

60) $|5n + 6| = 26$

61) $7a^2 - 10 = 270$

62) $-4 - 5r^2 = -184$

63) $7x^2 + 4 = 95$

64) $4x^2 - 3 = 61$

65) $5m^2 - 5 = 75$

66) $4k^2 - 9 = 351$

67) $\sqrt{b + 6} + 4 = 6$

68) $\sqrt{3x} = 3$

69) $-5 + \sqrt{3 - 2x} = -2$

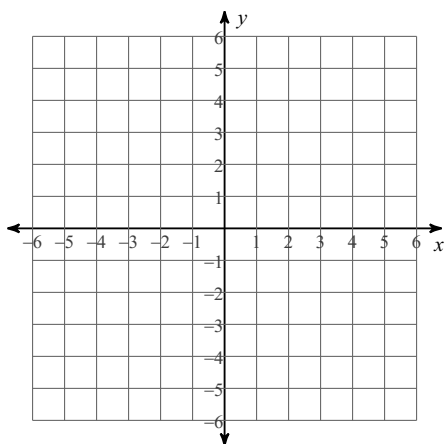
70) $5\sqrt{-3 - b} = 5$

71) $4 = \sqrt{-5 - 21n} - 6$

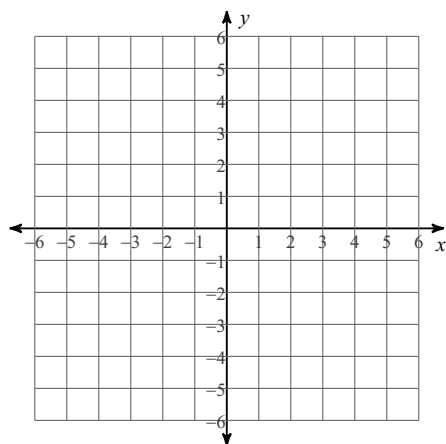
72) $-100 = -10\sqrt{100x}$

Graph each equation using transformations

73) $y = |x| + 3$

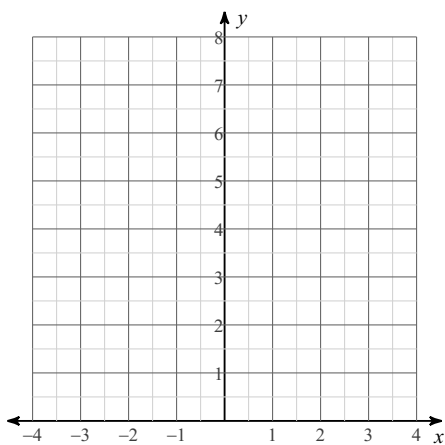


74) $y = |x + 3|$



Graph each equation using transformations.

75) $y = (x + 1)^2 + 3$



76) $y = -(x + 2)^2 - 2$

