

Chapter 9 Test Study Guide

Classify each as **M** (monomial), **B** (binomial), **T** (trinomial), **P** (polynomial), or **C** (constant).

1). C 7

2). B $4x^2 + 2$

3). P $7x^6 + 4x^2 - 3x^2 + 8x - 3$

4). m mn^4

5). T $3x^2 - 4x + 2$

6). B $x + 5$

Simplify and write each expression in standard form. Then name each polynomial by its degree and number of terms

7. $-2 + 12x^3 + 4x - 9x^2$

$$12x^3 - 9x^2 + 4x - 2$$

3rd degree Polynomial

8. $2 - 4b^3 + 6$

$$-4b^3 + 8$$

3rd degree binomial

9. $(2x^4 + 6x - 5) + (7x - 4 - x^4)$

$$+ \frac{-x^4 + 7x - 4}{x^4 + 13x - 9}$$

$$x^4 + 13x - 9$$

4th degree trinomial

10. $(2r + 8r^2 - 3) + (4r^2 + 6r + 2)$

$$+ \frac{4r^2 + 6r + 2}{8r^2 + 14r - 1}$$

$$8r^2 + 14r - 1$$

2nd degree trinomial

11. $(x^2 + 4) + (x + 4) + (x^2 - 2x)$

$$\begin{array}{r} x^2 \quad \quad + 4 \\ 2 - x \quad + 4 \\ + \quad x - 2x \\ \hline 2x^2 - 3x + 8 \end{array}$$

2nd degree trinomial

12. $(x^2 + 15x + 13) + (3x^2 - 15x + 7)$

$$\begin{array}{r} + 3x^2 - 15x + 7 \\ \hline 4x^2 + 20 \end{array}$$

2nd degree binomial

Factor out a monomial

13. $12c^3 - 30c^2$

$$6c^2(2c - 5)$$

14. $3y^3 - 8y^2 - 9y$

$$y(3y^2 - 8y - 9)$$

15. $6x^4 + 12x^2$

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

16. $8y^3 + 16y^2 - 8y$

$$8y(y^2 + 2y - 1)$$

Simplify each product using any method

17. $5x(x-6)$ Distribute

$5x^2 - 30x$

18. $(w-2)^2$ ← Perfect Square trinomial

$w^2 - 4w + 4$

or

$(w-2)(w-2) = w^2 - 2w - 2w + 4$
 $= w^2 - 4w + 4$

19. $(5c^2 - 7c)(5c^2 + 7c)$

FOIL $25c^4 + 35c^2 - 35c^2 - 49c^2$
 $25c^4 - 49c^2$

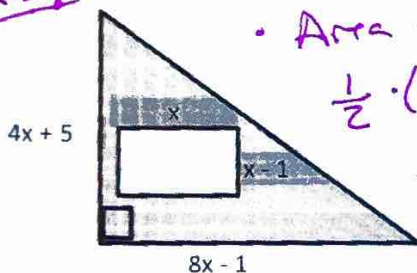
or Difference of 2 squares.
 $25c^4 - 49c^2$

20. $(x-5)(2x^2 - 7x - 2)$

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

$2x^3 - 17x^2 + 33x + 10$

Challenge 21. Find the area of the shaded region



• Area of the triangle - Area of the rectangle.

$\frac{1}{2} \cdot (8x-1)(4x+5) - x(x-1)$

$\frac{1}{2} (32x^2 + 40x - 4x - 5) - x^2 + x$

$16x^2 + 18x - \frac{5}{2} - x^2 + x$

$15x^2 + 19x - \frac{5}{2}$

22. $(2r^2 - 9r + 11)(2r - 1)$

	$2r^2$	$-9r$	11
$2r$	$4r^3$	$-18r^2$	$22r$
-1	$-2r^2$	$9r$	-11

$4r^3 - 20r^2 + 31r - 11$

**23. $(3r-2)^2(3r+2)$

← P.S.T.

$(3r-2)^2 = 9r^2 - 12r + 4$

$(9r^2 - 12r + 4)(3r+2)$
 $27r^3 - 18r^2 - 12r + 8$

	$9r^2$	$-12r$	4
$3r$	$27r^3$	$-36r^2$	$12r$
2	$18r^2$	$-24r$	8

***24. $(5x^4 - 4x^2 + 3x + 7)(5x^8 + 3x^5 - 2x^3 + 7x^2 - 3x + 2)$

	$5x^4$	$-4x^2$	$3x$	7
$5x^8$	$25x^{12}$	$-20x^{10}$	$15x^9$	$35x^8$
$3x^5$	$15x^9$	$-12x^7$	$9x^6$	$21x^5$
$-2x^3$	$-10x^7$	$6x^4$	$-14x^3$	$49x^2$
$7x^2$	$35x^6$	$-28x^4$	$49x^2$	$-21x$
$-3x$	$-15x^5$	$12x^3$	$-21x$	14
2	$10x^4$	$-8x^2$	$6x$	

→ See top of the following page.

$$25x^{12} - 20x^{10} + 30x^9 + 35x^8 - 22x^7 + 44x^6 + 14x^5 - 24x^4 + 19x^3 + 32x^2 - 15x + 14$$

Factor completely: use any method you want

25. $d^2 + 8d + 7$

$$\begin{matrix} \wedge \\ 1, 7 \end{matrix} \quad 1+7=8$$

$$(d+1)(d+7)$$

26. $c^2 - c - 6$

$$\begin{matrix} \wedge \\ -3, 2 \end{matrix} \quad -3+2=-1$$

$$(c-3)(c+2)$$

27. $g^2 + 10g + 24$

$$\begin{matrix} \wedge \\ 6, 4 \end{matrix} \quad 6+4=10$$

$$(g+6)(g+4)$$

28. $y^2 - 23y + 60$

$$\begin{matrix} \wedge \\ -3, -20 \end{matrix} \quad -3+(-20)=-23$$

$$(y-3)(y-20)$$

29. $18x^2 - 27x + 4$

$$\begin{matrix} 18 \cdot 4 = 72 \\ -27 \cdot -3 = -24 \\ -24 + -3 = -27 \end{matrix}$$

$$\begin{matrix} 18x^2 - 24x - 3x + 4 \\ 6x(3x-4) - 1(3x-4) \\ (6x-1)(3x-4) \end{matrix}$$

30. $6t^2 - 11t + 4$

$$6 \cdot 4 = 24$$

-3, -8
factors of 24
whose sum = -11

$$\begin{matrix} 6t^2 - 3t - 8t + 4 \\ 3t(2t-1) - 4(2t-1) \\ (3t-4)(2t-1) \end{matrix}$$

31. $12y^2 + 19y + 5$

$$12 \cdot 5 = 60$$

$$\begin{matrix} 12y^2 + 4y + 15y + 5 \\ 4y(3y+1) + 5(3y+1) \\ (4y+5)(3y+1) \end{matrix}$$

$$\begin{matrix} \times 5 + 12 = 17 \\ \times 3 + 20 = 23 \\ \times 2 + 30 = 32 \\ \times 6 + 10 = 16 \\ 4 + 15 = 19 \end{matrix}$$

32. $3x^2 - 10x + 8$

$$3 \cdot 8 = 24$$

$$\begin{matrix} -6 \cdot -4 = 24 \\ -6 + -4 = -10 \end{matrix}$$

$$\begin{matrix} 3x^2 - 6x - 4x + 8 \\ 3x(x-2) - 4(x-2) \\ (3x-4)(x-2) \end{matrix}$$

33. $16y^2 - 56y + 49$

Perfect Square trinomial

$$a^2 - 2ab + b^2 = (a-b)^2$$

$$(4y)^2 - 2 \cdot 4y \cdot 7 + 7^2 = (4y-7)^2$$

34. $2a^3 + 40a^2 + 200a$

$$2a(a^2 + 20a + 100)$$

$$2a(a+10)^2$$

Perfect Square trinomial

35. $p^2 - 400$

Difference of 2 squares.

$$a^2 - b^2 = (a+b)(a-b)$$

$$p^2 - 100^2 = (p+10)(p-10)$$

36. $256x^2 - 1$

Difference of 2 squares

$$(16x)^2 - 1^2 = (16x+1)(16x-1)$$

37. $10x^2 - 3x - 1$ $10 \cdot -1 = -10$

$10x^2 - 5x + 2x - 1$ $+2, -5$

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

38. $4x^3 - 20x^2 + 3x - 15$

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

39. $5p^3 - p^2 + 15p - 3$

$p^2(5p-1) + 3(5p-1)$
 $(p^2+3)(5p-1)$

40. $ab + 7b - 3a - 21$

$b(a+7) - 3(a+7)$
 $(b-3)(a+7)$

41. $8x^4 + 6x - 28x^3 - 21$

$2x(4x^3+3) - 7(4x^3+3)$
 $(2x-7)(4x^3+3)$

42. $28x^3 + 212x^2 + 112x$

$4x(7x^2 + 53x + 28)$ $7 \cdot 28 = 196$
 $4x[7x^2 + 49x + 4x + 28]$ $\begin{matrix} 1 \\ 4, 49 \end{matrix}$
 $4x[7x(x+7) + 4(x+7)]$
 $4x[(x+7)(7x+4)]$
 $4x(x+7)(7x+4)$