# Unit 1 – 7 Polynomials

Name: _____

| Name | Examples | | Non-Examples |
|---|---|---|---|
| **Monomial** *(one term)* | 1. $3x^4$ | *degree:4* | 1. $2x^{-4}$ |
| | 2. $a^2$ | *degree:2* | 2. $5\sqrt{m}$ |
| | 3. $5$ | *degree:0* | 3. $3t^{\frac{2}{3}}$ |
| **Binomial** *(two terms)* | 1. $2n^3 - n$ | *degree:3* | 1. $\frac{2x+1}{x}$ |
| | 2. $p - 3$ | *degree:1* | |
| | 3. $-3a^3b^4 + a^4b^5$ | *degree:9* | 2. $\sqrt{c^3 - 2}$ |
| **Trinomial** *(three terms)* | 1. $-2x^3 + 2x - 3$ | *degree:3* | 1. $x^{-3} + 2x - 5$ |
| | 2. $d(d^2 + 2d^4 - 2)$ | *degree:5* | 2. $2^x + 3x - 5$ |
| **Polynomial** *(one or more terms)* | 1. $3x^4 + 2x^3 - 5x + 1$ | *degree:4* | 1. $3q^3 + \frac{p}{q}$ |
| | 2. $5y^6$ | *degree:6* | |
| | 3. $\frac{1}{2}x^2 + \sqrt{3}\,x^3 - 6x^4 + 1x - 3$ | *degree:4* | 2. $2^x + 3\sqrt{x}$ |

**1. EXPAND and SIMIPLIFY (Also, list the degree and leading coefficient of your answer).**

a. $(7x+3)-(2-2x)$

b. $(5x^3 - 3x^4 - 2x - 9x^2 - 2) + (3x^3 + 2x^2 - 5x - 7)$

c. $3(x+5)+8x$

d. $-2(3x+2y)-(5x-6y)+2x-7$

e. $(2x^2+5x)-(6x^2-2x)$

f. $(2x^3+5x-8)+(5x^3-9x^2-11x+5)$

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

h. $(2x-5)^2$

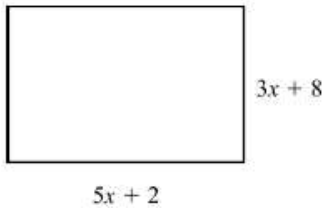
**(1 Continued). EXPAND and SIMIPLIFY**

i. $4y^2\left(y^2+2y\right)$

j. $-6y^2(3y^2-2y-7)$

k. $(x+3)(x+5)$

l.

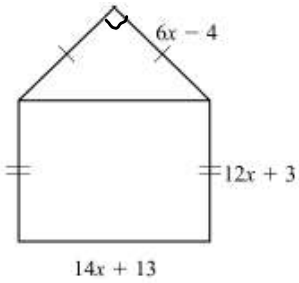



*Determine an expression that represents:*

Perimeter =

Area =

m




*Determine an expression that represents:*

Perimeter =

Area =

**2. Divide the following.**

a. $\dfrac{32a^5+24a^3}{8a^3}$

b. $\dfrac{21x^4+3x^3}{3x^2}$

c. $\dfrac{36a^3d^5+72a^2d^3}{6ad^2}$

***3. Factor the GCF from each expression***

a. $15x^4+3x^5$

a.

b. $16x^2+24$

b.

c. $18x^4y^7+36x^3y^6-42x^5y^5$

c.

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

d.

# Section 1-8 Radical Rules

PRODUCT RULE:

$\sqrt[a]{x} \cdot \sqrt[a]{y} = \sqrt[a]{xy}$

Example:

$\sqrt{10} \cdot \sqrt{x} = \sqrt{10x}$

QUOTIENT RULE:

$\frac{\sqrt[a]{x}}{\sqrt[a]{y}} = \sqrt[a]{\frac{x}{y}}$

Example:

$\frac{\sqrt{10}}{\sqrt{2}} = \sqrt{\frac{10}{2}} = \sqrt{5}$

More directly, when determining a product or quotient of radicals and the indices (the small number in front of the radical) are the same then you can rewrite 2 radicals as 1 or 1 radical as 2.

**Simplify by rewriting the following using only one radical sign (i.e. rewriting 2 radicals as 1).**

1. $\sqrt{3} \cdot \sqrt{12}$

2. $\frac{\sqrt{12}}{\sqrt{3}}$

3. $\sqrt{7x} \cdot \sqrt{2y}$

4. $\frac{\sqrt[3]{12x^2}}{\sqrt[3]{4x}}$

**Simplify by rewriting the following using multiple radical sign (i.e. rewriting 1 radical as 2).**

5. $\sqrt{\frac{144}{25}}$

6. $\sqrt{\frac{x^6}{121}}$

**Express each radical in simplified form.**

7. $\sqrt{48}$ P

8. $\sqrt{450x^4y^5}$ N

9. $\sqrt{72x^5y^6}$ O

10. $\sqrt{300x^{12}}$ O

11. $\sqrt{675x^4y^{11}}$ N

12. $-\sqrt{81x^3y^8}$ A

13. $\sqrt[3]{48x^7y^3}$ N

14. $\sqrt[3]{81x^{10}y^3}$ I

15. $\sqrt[3]{-27x^5}$ K

Use the letters and answers to match the answer to the riddle. **Only some answers will be used.**

**"What is an opinion without π?"**

| | | | | | | |
|---|---|---|---|---|---|---|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| $-9xy^4\sqrt{x}$ | $15x^2y^2\sqrt{2y}$ | $10x^6\sqrt{3}$ | $2x^2y\sqrt[3]{6x}$ | $3x^3y\sqrt[3]{3x}$ | $6x^2y^3\sqrt{2x}$ | $15x^2y^5\sqrt{3y}$ |

**Express each radical in simplified form.**

16. $\sqrt{6x} \cdot \sqrt{12x}$

17. $\sqrt{18a^5} \cdot \sqrt{6a^4}$

**Simplify. Assume that all variable represent positive real numbers.**

18. $5\sqrt{3} + \sqrt{2} - 2\sqrt{3} + 4\sqrt{2}$

19. $\sqrt{108} + 5\sqrt{12} - 4\sqrt{44}$

20. $2\sqrt{150} + \sqrt{18} + 3\sqrt{8} - \sqrt{24}$

21. $y\sqrt{18} - 3\sqrt{12y^4} + 2\sqrt{8y^2}$

22. $x\sqrt{32x^2} + 2\sqrt{18x^4}$

23. $5\sqrt{18x^4} - 3x\sqrt{8x^2} - x^2\sqrt{2}$

24. $2\sqrt{10}\left(3\sqrt{6} + 2\sqrt{5} - \sqrt{24}\right)$

25. $\sqrt{2x}\left(\sqrt{6x} + 3\sqrt{x}\right)$

26. $3\sqrt{6a}\left(\sqrt{4a} + 2\sqrt{15a^2}\right)$

Tell whether you think the following numbers are Rational or Irrational.

11. $\sqrt{8}$

Circle One: Rational Irrational

12. $\sqrt{2+\sqrt{49}}$

Circle One: Rational Irrational

13. $2\sqrt{27}-\sqrt{3}-\sqrt{75}$

Circle One: Rational Irrational

14. $\pi$

Circle One: Rational Irrational

15. $\sqrt{12}\cdot\sqrt{3}$

Circle One: Rational Irrational

16. $e^2$

Circle One: Rational Irrational

17. $\sqrt[3]{64}$

Circle One: Rational Irrational

18. $\sqrt[3]{24}$

Circle One: Rational Irrational

19. $3.2313\overline{131}$

Circle One: Rational Irrational

20. $3.12112111211112\ldots.$

Circle One: Rational Irrational

21. $\varphi=\frac{1+\sqrt{5}}{2}\approx 1.618034\ldots$

Circle One: Rational Irrational

22. $81^{-\frac{3}{4}}$

Circle One: Rational Irrational