East Los Angeles College
Department of Mathematics
Math 115
Test 3

42 ✓

Use properties of exponents to evaluate the following. Write as positive exponents:

1. $2x^3 \cdot 4x^2$ $\boxed{8x^5}$ ✓

2. $\frac{15x^4}{5x^2}$ $\boxed{3x^2}$ ✓

3. $(z^5)^3$ $\boxed{z^{15}}$ ✓

4. $(5x^4)^2$ $\boxed{25x^8}$ ✓

5. 12345^0 $\boxed{1}$ ✓

6. 2^{-3} $\boxed{\frac{1}{8}}$ ✓

7. 5^{-2} $\boxed{\frac{1}{25}}$ ✓

8. 10^{-1} $\boxed{\frac{1}{10}}$ ✓

9. $5x^2 \cdot 3x^{-4}$ $\boxed{\frac{15}{x^2}}$ ✓

10. $\frac{20x}{4x^5}$ $\boxed{\frac{5}{x^4}}$ ✓

11. $\frac{12x^{-3}}{4x}$ $\boxed{\frac{3}{x^4}}$ ✓

12. $\frac{18a^4b^{-2}}{2a^{-1}b}$ $\boxed{\frac{9a^5}{b^3}}$ ✓

13. $3xy^2 \cdot 5xy$ $\boxed{15x^2y^3}$ ✓

14. $\frac{28xy^3}{4x^2y}$ $\boxed{\frac{7y^2}{x}}$ ✓

15. $4a^{-2}b \cdot 2ab^{-4}$ $\boxed{\frac{8}{ab^3}}$ ✓

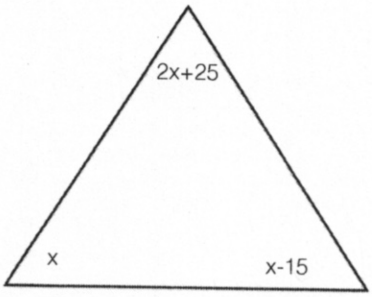
16. $\frac{16ab^{-2}}{2a^{-3}b}$ $\boxed{\frac{8a^4}{b^3}}$ ✓

17. $(xy^2)^{-3}$ $\boxed{\frac{1}{x^3y^6}}$ ✓

18. $(6x^3y)^2$ $\boxed{36x^6y^2}$ ✓

18 ✓

19. Determine the smallest angle.



✓

$x + 2x + 25 + x - 15 = 180^\circ$

$4x + 10 = 180$ ✓

$x = 42.5^\circ$; smallest $= 27.5^\circ$

✓ ✓

20. **Complementary Angles**- Two angles are complementary. If one angle measures 15 degrees more than twice the other angle, what is the measure of the angles?

$x + y = 90$ ✓

$x = 2y - 15$ ✓

$x = 55^\circ$; $y = 35^\circ$

✓ ✓

8 ✓

21. **Rectangle-** The perimeter of a rectangle is 42 meters. If the length is one more than three times the width, what are the dimensions (length and width)?

$2L + 2w = 42$ ✓

$L = 3w + 1$ ✓

$L = 16$; $w = 5$

✓ ✓

Expand the following.

22. 5.25×10^{6}

$5,250,000$

✓

23. 1.24×10^{-8}

$.0000000124$

✓

Write using Scientific Notation

24. $134,000,000$

1.34×10^{8}

✓ ✓

25. $.0000068$

6.8×10^{-6}

✓ ✓

Add or Subtract the following.

26. $(5x^2 - 4x - 3) + (2x^2 - 5x + 6)$

$7x^2 - 9x + 3$ ✓ ✓ ✓

27. $(5x^2 - 4x - 3) - (2x^2 - 5x + 6)$

$3x^2 + x - 9$ ✓ ✓ ✓

16 ✓

math 115 Test 3

① $2x^3 \cdot 4x^2 = 2 \cdot 4 \cdot x^3 \cdot x^2$

$= \boxed{8x^5}$

② $\frac{15x^4}{5x^2} = \frac{15}{5} x^{4-2} = \boxed{3x^2}$

③ $(z^5)^3 = \boxed{z^{15}}$

④ $(5x^4)^2 = 5^2 x^8$

$= \boxed{25x^8}$

⑤ $12345^0 = \boxed{1}$

⑥ $2^{-3} = \frac{1}{2^3} = \boxed{\frac{1}{8}}$

⑦ $5^{-2} = \frac{1}{5^2} = \boxed{\frac{1}{25}}$

⑧ $10^{-1} = \frac{1}{10^1} = \boxed{\frac{1}{10}}$

⑨ $5x^2 \cdot 3x^{-4}$

$5 \cdot 3 x^2 x^{-4}$

$15x^{-2}$

$\boxed{\frac{15}{x^2}}$

⑩ $\frac{20x}{4x^5} = \frac{20}{4} x^{1-5}$

$5x^{-4}$ $\boxed{\frac{5}{x^4}}$

⑪ $\frac{12x^{-3}}{4x} = \frac{12}{4} x^{-3-1} = 3x^{-4}$

$= \boxed{\frac{3}{x^4}}$

⑫ $\frac{18a^4 b^{-2}}{2a^{-1} b}$

$\frac{18}{2} a^{4-(-1)} b^{-2-1}$

$9a^{4+1} b^{-3}$

$\boxed{\frac{9a^5}{b^3}}$

⑬ $3xy^2 \cdot 5xy$

$3 \cdot 5 \cdot x \cdot x y^2 \cdot y$

$\boxed{15x^2y^3}$

⑭ $\frac{28xy^3}{4x^2y}$

$\frac{28}{4}x^{1-2}y^{3-1}$

$7x^{-1}y^2$

$\boxed{\frac{7y^2}{x}}$

⑮ $4a^{-2}b \cdot 2ab^{-4}$

$4 \cdot 2 \cdot a^{-2} \cdot a^1 \cdot b^1 \cdot b^{-4}$

$8a^{-2+1}b^{1-4}$

$8a^{-1}b^{-3}$

$\frac{8}{a^1b^3}$ $\boxed{\frac{8}{ab^3}}$

⑯ $\frac{16ab^{-2}}{2a^{-3}b}$

$\frac{16}{2}a^{1--3}b^{-2-1}$

$8a^{1+3}b^{-3}$

$8a^4b^{-3}$

$\frac{8a^4}{b^3}$

⑰ $(x^1y^2)^{-3}$

$x^{-3}y^{-6}$

$\boxed{\frac{1}{x^3y^6}}$

⑱ $(6x^3y)^2$

$6^2x^6y^2$

$\boxed{36x^6y^2}$

⑲ $x + 2x + 25 + x - 15 = 180°$

$4x + 10 = 180$

$\quad -10 \qquad -10$

$\frac{4x}{4} = \frac{170}{4}$; $\boxed{x = 42.5°}$

$x - 15 = 42.5° - 15$; $2x + 25 = 2 \cdot 42.5 + 25$

$= \boxed{27.5°}$ $\qquad = \boxed{110°}$

smallest

⑳ $x + y = 90$

one angle = 15 more than twice the other

$x \qquad\qquad\qquad\qquad\qquad\qquad y$

$x = 2y - 15$

ie, $x + y = 90$

$x = 2y - 15$ use Substitution

$2y - 15 + y = 90$ $\qquad x = 2 \cdot 35 - 15$

$3y - 15 = 90$ $\qquad x = 70 - 15$

$+15 \quad +15$

$\boxed{x = 55°}$

$\frac{3y}{3} = \frac{105}{3}$; $\boxed{y = 35°}$

㉑ $p = 42$; $p = 2L + 2w$

$\boxed{2L + 2w = 42}$

length is one more than three times width

L = one more than $3w$

$\boxed{L = 3w + 1}$ use substitution

$2(3w+1) + 2w = 42$; $L = 3\underset{\underset{5}{\downarrow}}{w} + 1$

$6w + 2 + 2w = 42$

$L = 3 \cdot 5 + 1$

$8w + 2 = 42$

$\quad -2 \quad -2$

$L = 15 + 1$

$\frac{8w}{8} = \frac{40}{8}$

$\boxed{L = 16}$

$\boxed{w = 5}$

㉒ 5.25×10^6

5.250000

$\boxed{5,250,000}$

㉓ 1.24×10^{-8}

0000001.24

$\boxed{.000000124}$

(24) $134{,}000{,}000$

$\boxed{1.34 \times 10^{8}}$

(25) $.0000068$

$\boxed{6.8 \times 10^{-6}}$

(26) $(5x^2 - 4x - 3) + (2x^2 - 5x + 6)$

$5x^2 - 4x - 3 + 2x^2 - 5x + 6$

$\boxed{7x^2 - 9x + 3}$

(27) $(5x^2 - 4x - 3) - (2x^2 - 5x + 6)$

$5x^2 - 4x - 3 - 2x^2 + 5x - 6$

$\boxed{3x^2 + x - 9}$