Math 94 Review for Test 3: Sections 3.4, 5.1 – 5.6, 6.1

Simplify (The answers are to have only positive exponents.):

1a) $(2a^2b^3)(6ab^4)$ 1b) $\frac{6y^4}{2y^2}$

2a) $(-3x^2)^2$ 2b) $\frac{10xy}{5y^5}$

3. $\left(\frac{3x}{2x^3}\right)^2$

4. $(2x^3)^2(5x^4)$

5a) $\frac{z^2}{z^{-2}}$ 5b) $(x^2)^{-4}$

6. $(4x^{-2}y^4)(3x^3y^{-6})$

7. $\frac{8x^{-3}y^0}{2x^{-4}y^2}$

8. Express each number in scientific notation:

(a) 21,300 (b) 0.0002

9. Express each number without exponents:

(a) 5.4×10^3 (b) 2.81×10^{-2}

10. The mass of one proton is approximately 1.7×10^{-24} gram. Find the mass of 8 million protons. Write your answer in scientific notation.

11. Express the polynomial in descending order and give its degree: $6x - x^3 + 4$

12. Add: $(2x^3 + 5x) + (-3x^3 + 8x^2)$

13. Subtract: $(4x - 3) - (-2x + 3)$

14. Subtract: $(2x^2 + 3x - 5) - (x^2 - 3x - 2)$

Multiply:

15. $(5x^3y^2)(-3xy^3)$

16. $4x^3(2x^2-3x+5)$

17. $(2x+3)(3x-2)$

18. $(3x-5)(3x+5)$

19. $(4x-3y)(3x+y)$

Divide:

20a) $\dfrac{-8x+4}{-2}$ (b) $\dfrac{9x^4-12x^3+3x^2}{3x^2}$

21. $\dfrac{15x^3-10x}{5x^2}$

Factor out the greatest common factor (GCF):

22a) b^3-3b^2 (b) $6x^3-2x$

23. $4x^3y-6xy^2+4xy$

Set up an appropriate table and use an algebraic formula to solve:

24. Indianapolis is 1000 miles from Amarillo. Andy left Indianapolis, traveling toward Amarillo at an average speed of 60 miles per hour. Two hours later, Millie left Amarillo, traveling toward Indianapolis at an average speed of 50 miles per hour. How long after Andy left Indianapolis will they meet?

25. Granville and Preston are 550 miles apart. A car leaves Preston bound for Granville; at the same time, another car leaves Granville bound for Preston, traveling 10 mph faster than the other car. If they meet after 5 hours, find the speed of each car.

26. Brad ran at 3.5 mph for 0.2 hours and then began bicycling at 15 mph. If he went a total of 8.2 miles, how long did he bicycle?

27. The Smiths invested $7500, part at 8% simple interest and part at 5% simple interest. If they received a total annual interest of $525, how much did they invest at each rate?

28. A pharmacist has a 30% solution of a certain drug and a 12% solution of the same drug. How much of each solution should she mix, in order to make 6 liters of a 24% solution of the drug?