Pre-Calculus Summer Math

This is a short collection or problems that represent skills you need to have before starting my class. You should be able to do all of the following without a calculator. If there is anything in this that you don't know how to do or struggle with you need to let me know first thing next year so we can go over it together. Answers are at the end.

1. Find the Decimal form of $\frac{-37}{8}$ state whether it terminates or repeats.

2. Translate the following to **interval notation:** $x > -3$

3. Use the distributive property to expand $a(x^2 + b)$

4. Find the distance between the points $(-3, -1)$ and $(5, -1)$.

5. Prove that the figure determined by the points is an isosceles triangle: $(1,3), (4,7), (8,4)$.

6. Write the following statement using absolute value notation: The distance between x and 4 is 3.

7. Find which values of x are solutions to $2x^2+5x=3$.

(a) $x=-3$ (b) $x=\frac{-1}{2}$ (c) $x=\frac{1}{2}$

8. Solve, $3t-4=8$

9. Solve, $\frac{x-5}{4}+\frac{3-2x}{3}<-2$

10. Find the slope of the line through the pair of points: $(-2,-5)$ and $(-1,3)$.

11. Find a slope intercept form equation for the line through $(0,5)$ with slope $m=-3$.

12. Find **(a)** an equation for the line passing through the point and parallel to the given line, and **(b)** an equation for the line passing through the point and perpendicular to the given line.

Point: $(1,2)$ **Line:** $y=3x-2$

13. What are the square roots of $\frac{16}{9}$?

14. Convert $x^{\frac{-5}{3}}$ to radical form.

15. Simplify the following radical expression: $\sqrt[3]{\frac{4x^2}{y^2}} \cdot \sqrt[3]{\frac{2x^2}{y}}$

16. Is $x^3-2x^2+x^{-1}$ a polynomial? Why or why not?

17. Expand the following : $(2x^3-3y)(2x^3+3y)$

18. Factor the following by grouping: $x^3 - 4x^2 + 5x - 20$

19. Rewrite $\frac{5}{9} + \frac{10}{9}$ as a single fraction.

20. Simplify, $\frac{x^3 - 1}{2x^2} \cdot \frac{4x}{x^2 + x + 1}$

21. Simplify, $\frac{2x + \frac{13x - 3}{x - 4}}{2x + \frac{x + 3}{x - 4}}$

Answers:
1. -4.625

2. (-3, ∞)

3. ax^2+ab

4. 8

5. Find the distance between each pair of points:
(1,3) to (4,7) : 5

(1,3) to (8,4) : $\sqrt{50}$

(4,7) to (8,4) : 5

Since, two of the sides are the same length, this is an isosceles triangle.
(This is not a formal proof, we will learn how to do those later.)

6. $|x-4|=3$

7. $\{-3,\frac{1}{2}\}$

8. $t=4$

9. $\frac{21}{5}$

10. 8

11. $y=5-3\text{x}$

12. (a) $y=3\text{x}-1$ (b) $y=-\frac{1}{3}x+\frac{7}{3}$

13. $\frac{4}{3}$ and $-\frac{4}{3}$

14. $\frac{1}{\sqrt[3]{x^5}}$

15. $\frac{2\text{x}\sqrt[3]{x}}{y}$

16. Nope. No negative exponents allowed on a variable.

17. $4x^6 - 9y^2$

18. $(x^2+5)(x-4)$

19. $\frac{15}{9}$

20. $\frac{2(x-1)}{x}$

21. $\frac{(x+3)}{(x-3)} \qquad x \neq \frac{1}{2}$