MAT 012 **PRACTICE TEST 3**

Prof. Clayton Will not be collected, but will help you prepare for the test.

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For the "roots" and "radicals", we are assuming that all variables/variable expressions stand for positive values unless the instructions specifically state that the variables/variable expressions can assume ANY real value.

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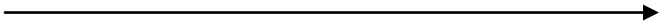
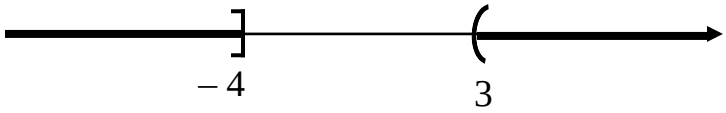
1. Find the two solutions of the equation $|2x-5|-3=10$

2. Solve, then **graph** the solutions **on the number line**, also give the answers in interval notation. $1 \le 3x+4 < 16$

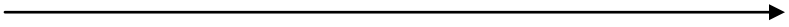
In **interval notation**:



3. Give in interval notation:



4. Solve, then graph the solutions on a number line and state them in interval notation:
$|4x-9|+2>13$



Interval notation:

5. Solve, then graph the solutions on a number line and state them in interval notation:
$-4\left|2x-7\right|\geq -12$

Interval notation:

6. Solve $\left|3x-2\right|<-7$

4. Solve $\left|6x-8\right|>-10$

5. Give the solutions to $x^2=25$

6. Simplify: $\sqrt{49x^6}$ =

7. Simplify: $\sqrt[20]{a^{15}b^5}$ =

8. Simplify: $\sqrt[3]{-64x^3}$ =

9. Evaluate $\left(\frac{1}{81}\right)^{-\frac{1}{4}}$

10. Convert to an equivalent expression with no negative exponents. Then write in radical notation: $a^{\frac{4}{3}}b^{-\frac{1}{2}}$ =

11. Convert to an equivalent expression with no negative exponents. Simplify and write in radical notation: $\frac{a^{\frac{2}{5}}c^{-\frac{1}{3}}b^{\frac{3}{4}}}{a^{-\frac{1}{5}}}$ =

12. Simplify and give the answer in radical notation: $\sqrt[4]{x} \cdot \sqrt[3]{x^2}$ =

13. Write in fractional exponent notation: $\sqrt[5]{(4x)^3}$ =

14. Simplify the numerator. Then write with no negative powers and convert to radical notation:

$$\frac{125^{\frac{1}{3}}}{x^{-\frac{1}{2}}} =$$

15. Simplify: $\sqrt[4]{\sqrt{2x}}$ =

16. Simplify: $\sqrt[5]{\sqrt[3]{x}}$ =

17. Simplify: $\sqrt{720}$ =

18. Simplify: $\sqrt[6]{4096\, x^{18}\, y^{12}}$ =

19. Simplify: $\sqrt{810\, a^{11} b^6}$ =

20. Simplify $\sqrt[4]{81x^9 y^{15}}$ =

21. Combine and simplify as much as possible: $\sqrt{3x^5} \cdot \sqrt{6x^4}$

22. Combine, then simplify as much as possible:

$\sqrt[3]{-4x^5 y^7} \cdot \sqrt[3]{54\, x^5 y}$ =

23. Combine, then simplify as much as possible:

$$\sqrt{\frac{5a^2}{4b}} \cdot \sqrt{\frac{15b^4}{2a^2}}$$

24. Simplify:

$$\sqrt[5]{\frac{32\,y^{10}x^{-10}}{81\;z^{-3}}}\cdot\sqrt[5]{\frac{3^{-1}\,x^{-10}}{y^{-5}\,z^{3}}}\;=$$

25. Simplify $3\sqrt{8}+\sqrt{32}-4\sqrt{50}\;=$

26. Simplify $2\sqrt{180}+\sqrt{12}-4\sqrt{48}-\sqrt{45}$

27. Find the distance between $(-4,\ 10)$ and $(2,\ 6)$.
*Give the answer exact **and then** a decimal approximation* (*rounded to one decimal place*).

28. Algebraically, find the midpoint of the line segment from $(-9,\ -7)$ to $(1,\ 3)$
(*Give your answer in ordered pair notation*.)

29. Multiply and simplify: $5\sqrt{6}\left(3\sqrt{2}-\sqrt{5}\right)$

30. Multiply and simplify: $\left(5\sqrt{3}-3\sqrt{2}\right)\left(4\sqrt{3}-2\sqrt{7}\right)$

For these last problems, each variable can assume **ANY real value**. (Put absolute value where necessary, but ONLY where necessary.) If the expression is not defined in the real numbers, say so. If the expression cannot be simplified, say so.

31. a) Evaluate $\sqrt[3]{-216}$ =

b) Simplify $\sqrt{x^{18}}$ =

c) Simplify $\sqrt[3]{64x^3}$ =

d) Simplify $\sqrt{\dfrac{x^2}{y^6}}$ =

e) Simplify $\sqrt[4]{625x^{12}}$ =

f) Simplify $-\sqrt{36x^{26}}$ =

g) Evaluate $\sqrt[6]{-64}$ =

h) Simplify $\sqrt[7]{x^{35}y^{14}}$ =

i) Simplify $-\sqrt[3]{-343x^{15}}$ =

j) Simplify $\sqrt{x^2+25}$ =

k) Simplify $\sqrt{x^2-6x+9}$ =

32. Simplify:

$$\frac{\frac{4}{x} - \frac{7}{x^2}}{\frac{3}{x^3} - \frac{5}{x}}$$

33. Simplify (After the initial steps, don't forget to factor and simplify again):

$$\frac{\frac{1}{b^2} - \frac{1}{a^2}}{\frac{1}{b} + \frac{1}{a}}$$