Practice Exam 3: Math 2-to-3B Place-Up Pathway Exam

Instructions

The Math 2-to-3B PUP-E has 23 questions and lasts 45 minutes. You must get 16 or more correct to pass. The exam is closed notes, no cheat sheets, and no calculator. **Time yourself** and take this practice exam under these conditions. Expect a range of difficulty levels, including both calculations and word problems. Do not work this exam until you have fully completed your review. Answers follow below. Detailed solutions are intentionally not provided; this will force you to discover the source of your errors.

Problems

1. Find $\frac{3}{2} - \frac{2}{5}$

2. Solve $4.2 - 1.7(t+1) = \frac{5 - 6.4t}{2}$

3. Solve $\frac{5-2x}{4} + 1 > 3$ and give your answer in inequality and interval notation.

4. Find $-\sqrt{144} + \sqrt{81}$

5. State the degree and leading coefficient of $6x - 4x^5 + 3x^2$

6. Factor $x^2 - 20x + 36$

7. Find the greatest common divisor (GCD) of 270 and 180.

8. Solve $\frac{7}{8}y + \frac{1}{3} = \frac{1}{2}$

9. Solve $0.25(4 - 8x) \geq -3x + 1.5$ and give your answer in inequality and interval notation.

10. Find $\left(\frac{x^2 y^{-3}}{x^{-1} y^{1/2}}\right)^{-3/2}$, avoiding negative exponents in your answer.

11. Solve $6^{2x+4} = 36$

12. Factor $18m^3 - 15m^2 - 12m$

13. Find the perimeter of the figure created when a regular octagon of side length 4 inches is joined along an edge with a regular pentagon of side length 4 inches.

14. An isosceles triangle has a base of 6.2 inches and a perimeter of 16.4 inches. What are the lengths of the other sides?

15. Find $\sqrt{3q^2} \cdot \sqrt{48q^3}$

16. A boat travels 24 miles downstream with the current in the same time it travels 18 miles upstream against the current. If the current is 3 mph, what is the boat's speed in still water?

17. Write the simplest expression for what you get after these steps: Begin with a number n, double it, cube the result, then square the result, then triple the result. Your answer will involve n.

18. A right triangle has a leg of length 4 inches and a leg of unknown length. Suppose the hypotenuse is two inches longer than the unknown leg. Find the perimeter of the triangle.

19. A rectangle with length $\frac{1}{3}$ foot and width $\frac{2}{5}$ foot is created from a bendable wire. If the wire is straightened and then reshaped to form a square, what is the side length of the square?

20. At swim practice, you swim 1000 meters, while your friend swims 1200 meters. Your friend swims 0.3 m/s faster than you. If you and your friend want to finish at the same time, how fast should you swim? Give your answer as a decimal.

21. A college wrestler who weighs 200 lbs wants to compete in the weight bracket that goes from 185 (inclusive) to 195 (exclusive) pounds. The athlete is curious what percentage of their current weight they would need to lose to make this happen. What percentage range is possible to land in the desired weight class? List your answer in interval notation.

22. Find the perimeter of a triangle with side lengths $\sqrt{12}$, $\sqrt{27}$, and $\sqrt{64}$.

23. A rectangular prism has length ℓ. The width of the prism is one more than the length, and the height is two less than the length. Find an expanded expression for the volume of the prism that uses no variables except ℓ.

Answers

1. $\frac{11}{10}$
2. $t = 0$
3. $x < -\frac{3}{2}$, $\left(-\infty, -\frac{3}{2}\right)$
4. -3
5. degree: 5, leading coefficient: -4
6. $(x - 18)(x - 2)$
7. 90
8. $\frac{4}{21}$
9. $x \geq \frac{1}{2}$, $\left[\frac{1}{2}, \infty\right)$
10. $\frac{y^{21/4}}{x^{9/2}}$
11. $x = -1$
12. $3m(2m + 1)(3m - 4)$
13. 44 inches
14. Both are 5.1 inches
15. $12q^2\sqrt{q}$
16. 21 mph
17. $192n^6$
18. 12 inches

19. $\frac{11}{30}$ feet

20. 1.5 m/s

21. $[0.025, 0.075)$ or $[2.5\%, 7.5\%)$

22. $8 + 5\sqrt{3}$

23. $\ell^3 - \ell^2 - 2\ell$