

MTH 28, Test 3, V. 4, 25/11/24

Prof. Luis Fernández

NAME: _____

There are 22 questions. Some are multiple choice and some are free response.
Each question is worth 5 points over 100 (so 10 points are extra credit).
For multiple-choice questions, just circle your answer.
For free-response questions, SHOW ALL WORK to receive credit.

1. Find the product

$$(-5\sqrt{3})(4\sqrt{5})$$

and write it in simplest radical form $A\sqrt{C}$.

2. Evaluate the expression: $125^{-\frac{2}{3}}$

3. Write using rational exponents: $\sqrt[3]{x^{10}}$

4. Write the expression

$$\left(\frac{a^{-3}}{3b^{-1/6}}\right)^{-1}$$

in the form $\frac{n \cdot a^r}{b^t}$.

5. Write the expression

$$\sqrt{108} - \sqrt{48}$$

in the form $A\sqrt{C}$.

6. Simplify each of the following:

(a) $\sqrt{32} =$ _____

(b) $\sqrt{27} =$ _____

(c) $\sqrt{18} =$ _____

(d) $\sqrt{50} =$ _____

(e) $\sqrt{72} =$ _____

(f) $\sqrt{300} =$ _____

7. Multiply and simplify

$$(8 + 2\sqrt{2})(8 - 2\sqrt{2})$$

Circle the answer.

(a) $72 + 32\sqrt{2}$

(b) $72 - 32\sqrt{2}$

(c) 56

(d) 72

8. Simplify.

$$-4\sqrt{27} - 2\sqrt{12} - 2\sqrt{147}$$

Circle the answer.

(a) $-30\sqrt{9}$

(b) $-8\sqrt{3}$

(c) $-8\sqrt{27}$

(d) $-30\sqrt{3}$

9. Rationalize (that is, write without radicals in the denominator):

$$\frac{\sqrt{13} - \sqrt{3}}{\sqrt{13} + \sqrt{3}}$$

10. Multiply and simplify

$$(3 + 2\sqrt{7})^2$$

Circle the answer.

- (a) 35
- (b) $37 + 12\sqrt{7}$
- (c) $23 + 12\sqrt{7}$
- (d) $37 - 12\sqrt{7}$

11. Simplify completely

$$\frac{\sqrt{2}\sqrt{30}}{\sqrt{5}}$$

Circle the answer.

- (a) $2\sqrt{3}$
- (b) $4\sqrt{3}$
- (c) $\sqrt{12}$
- (d) $3\sqrt{2}$

12. Simplify the expression

$$\sqrt{\frac{75}{11}},$$

and write it in the form $\frac{A\sqrt{B}}{C}$.

13. Solve the equation

$$\sqrt{2x-1} - 5 = 0$$

14. Solve the equation

$$\sqrt{2x+1} = 3\sqrt{x-1}$$

15. Solve the equation

$$\sqrt{4x} = x - 3.$$

16. Write $\sqrt{-32}$

as the product of a real number and i .

Circle the answer.

(a) $4\sqrt{2}i$

(b) $-2\sqrt{4}i$

(c) $-4\sqrt{2}$

(d) $2\sqrt{4}i$

17. Evaluate the expression

$$(7 + 2i) + (-5 + 7i)$$

and write the result in the form $a + bi$.

18. Evaluate the expression

$$\frac{-3 + i}{1 + 4i}$$

and write the result in the form $a + bi$.

19. Multiply

$$(-11 - 6i)(-8 - 9i)$$

20. Solve the quadratic equation

$$x^2 - 5x - 5 = 0$$

and write the solutions in simplified form.

21. Solve the quadratic equation

$$3x^2 + 8x - 3 = 0$$

and write the solutions in simplified form.

22. Solve the equation

$$2x^2 - 14 = 0$$