

NEATLY PRINT NAME: _____

SCORE: _____

1. (15 points) Factor :

a) $121a^6 - 169b^4$

b) $8x^3 - 27$

c) $6y^2 + 13y - 5$

2. (10 points) Solve $4y^4 + 5 = 9y^2$.

3. (5 points) Rationalize the denominator and fully simplify $\frac{1}{\sqrt{5}-2}$

- a) $\sqrt{5}+2$ b) $\frac{\sqrt{5}-2}{3}$ c) $\frac{2-\sqrt{5}}{9}$ d) $\frac{5+\sqrt{2}}{3}$ e) None of these

4. Fully simplify:

a) (3 points) $(-125)^{\frac{2}{3}} =$

b) (7 points) $\sqrt{12a^2} + \sqrt[3]{24a^{10}} + \sqrt{75a^2} - a(\sqrt[3]{81a^7})$

5. (5 points) Please circle True or False after each of the following statements:

- | | | |
|------------------------------------------|------|-------|
| a) 0 is a rational number | TRUE | FALSE |
| b) $\sqrt{-36}$ is a rational number | TRUE | FALSE |
| c) $-\sqrt{36}$ is a rational number | TRUE | FALSE |
| d) .2764 is a rational number | TRUE | FALSE |
| e) $\frac{\pi}{3}$ is a rational number. | TRUE | FALSE |

6. (5 points) Below is a list a properties from your textbook.

- A. Commutative Property of Addition
- B. Associative Property of Addition
- C. Additive Identity is Zero
- D. Every Real Number has an Additive Inverse
- E. Distributive Property of Multiplication over Addition
- F. Commutative Property of Multiplication
- G. Associative Property of Multiplication
- H. Multiplicative Identity is One
- I. Every non-zero number has a Multiplicative Inverse
- J. None of these

Below is a sequence of algebraic statements. $a \neq -b$ Please indicate which of the properties is being used.

a) $(3b + 3a)\left(\frac{1}{a+b}\right) = (3a + 3b)\left(\frac{1}{a+b}\right)$ _____

b) $(3a + 3b)\left(\frac{1}{a+b}\right) = 3(a+b)\left(\frac{1}{a+b}\right)$ _____

c) $3(a+b)\left(\frac{1}{a+b}\right) = 3\left[(a+b)\left(\frac{1}{a+b}\right)\right]$ _____

d) $3\left[(a+b)\left(\frac{1}{a+b}\right)\right] = 3(1)$ _____

e) $3(1) = 3$ _____

7. (10 points) Fully simplify $\frac{5b^{-1} + 2a^{-1}}{3b^{-2} - 2a^{-2}}$

8. (10 points) Given: $z_1 = 4 + i$ and $z_2 = 2 - 3i$,

a) Evaluate $|z_1 - \overline{z_2}|$

b) Evaluate and put into standard form: $z_1 z_2$

9. (10 points) Solve by completing the square $5x^2 + 2x = 1$

10. (5 points) Solve the formula $H = \frac{b}{D+d}$ for D

a) $D = Hb - d$

b) $D = b - Hd - H$

c) $D = \frac{b}{H} - d$

d) $D = \frac{b-d}{H}$

e) None of these

11. (5 points) Solve $|b - 8| - 5 > 13$

- a) $(-\infty, -16) \cup (10, \infty)$
- b) $(-\infty, -10) \cup (26, \infty)$
- c) $(26, \infty)$
- d) $(-10, 26)$
- e) None of these

12. (5 points) Solve $\frac{3x - 6}{x + 4} \geq 1$

- a) $(-\infty, -4] \cup [5, \infty)$
- b) $(-\infty, -4) \cup [5, \infty)$
- c) $[5, \infty)$
- d) $(-4, 5]$
- e) None of these

13. (10 points) Solve $\sqrt{3-t} - \sqrt{t+7} = 2$