BASIC ALGEBRA Exam 5A*   Name_____

Show all work on this test or on separate paper!   Calculators ARE allowed on this test!

In 1 - 25, simplify each radical completely. Leave answers in radical form.

1. $\sqrt{49}$

2. $\sqrt{81x^{12}}$

3. $\sqrt[3]{125}$

4. $\sqrt[3]{27x^3y^{12}}$

5. $\sqrt{20}$

6. $\sqrt{50}$

7. $\sqrt{72}$

8. $\sqrt[3]{24}$

9. $\sqrt[3]{250}$

10. $\sqrt{x^6y^9}$

11. $\sqrt{18x^7y^{12}}$

12. $\sqrt{60x^{11}y^{20}}$

13. $\sqrt{5} + \sqrt{5}$

14. $\sqrt{2} + \sqrt{98}$

15. $5\sqrt{27} - \sqrt{12}$

16. $\sqrt{7} \cdot \sqrt{5}$

17. $\sqrt{10} \cdot \sqrt{15}$

18. $\sqrt{46} \cdot \sqrt{69}$

19. $8\sqrt{10} \cdot 6\sqrt{2}$

20. $5\sqrt{6} \cdot 6\sqrt{15}$

21. $6\sqrt{5} \, (2\sqrt{3} + 5\sqrt{7})$

22. $3\sqrt{6} \, (2\sqrt{3} - 3\sqrt{2})$

23. $(3 + \sqrt{2})(5 - \sqrt{3})$

24. $(4 - \sqrt{6})^2$

25. $(4\sqrt{3} + 2\sqrt{6})^2$

26. Calculate the value of $(4\sqrt{3} + 2\sqrt{6})^2$.
(Round to nearest hundredth!)

BASIC ALGEBRA EXAM 5A* Solutions

1. $\sqrt{49} = \boxed{7}$　　2. $\sqrt{81x^{10}} = \boxed{9x^5}$　　3. $\sqrt[3]{125} = \boxed{5}$　　4. $\sqrt[3]{27x^3y^{12}} = \boxed{3xy^4}$

5. $\sqrt{20}$ 　6. $\sqrt{50}$ 　7. $\sqrt{72}$ 　8. $\sqrt[3]{24}$ 　9. $\sqrt[3]{250}$ 　10. $\sqrt{x^6y^9}$
$= \sqrt{4}\sqrt{5}$ 　$= \sqrt{25}\cdot\sqrt{2}$ 　$= \sqrt{36}\sqrt{2}$ 　$= \sqrt[3]{8}\sqrt[3]{3}$ 　$= \sqrt[3]{125}\cdot\sqrt[3]{2}$ 　$= \sqrt{x^6y^8}\sqrt{y}$
$= \boxed{2\sqrt{5}}$ 　$= \boxed{5\sqrt{2}}$ 　$= \boxed{6\sqrt{2}}$ 　$= \boxed{2\sqrt[3]{3}}$ 　$= \boxed{5\sqrt[3]{2}}$ 　$= \boxed{x^3y^4\sqrt{y}}$

11. $\sqrt{18x^7y^{12}}$ 　　12. $\sqrt{60x^{11}y^{20}}$ 　　13. $\sqrt{5} + \sqrt{5}$ 　14. $\sqrt{2} + \sqrt{98}$
$= \sqrt{9x^6y^{12}}\sqrt{2x}$ 　$= \sqrt{4x^{10}y^{20}}\sqrt{15x}$ 　$= \boxed{2\sqrt{5}}$ 　$= \sqrt{2} + \sqrt{49}\cdot\sqrt{2}$
$= \boxed{3x^3y^6\sqrt{2x}}$ 　$= \boxed{2x^5y^{10}\sqrt{15x}}$ 　　　$= \sqrt{2} + 7\sqrt{2} = \boxed{8\sqrt{2}}$

15. $5\sqrt{27} - \sqrt{12}$ 　　　16. $\sqrt{7}\cdot\sqrt{5}$ 　17. $\sqrt{10}\cdot\sqrt{15}$ 　18. $\sqrt{46}\cdot\sqrt{69}$
$= 5\sqrt{9}\sqrt{3} - \sqrt{4}\sqrt{3}$ 　$= \boxed{\sqrt{35}}$ 　$= \sqrt{2\boxed{5}\cdot3\boxed{5}}$ 　$= \sqrt{2\boxed{23}\cdot3\boxed{23}}$
$= 5\cdot3\sqrt{3} - 2\sqrt{3}$ 　　　　$= \boxed{5\sqrt{6}}$ 　$= \boxed{23\sqrt{6}}$
$= 15\sqrt{3} - 2\sqrt{3}\ \boxed{13\sqrt{3}}$

19. $8\sqrt{10}\cdot6\sqrt{2}$ 　20. $5\sqrt{6}\cdot6\sqrt{15}$ 　21. $6\sqrt{5}\left(2\sqrt{3} + 5\sqrt{7}\right)$
$= 48\sqrt{20}$ 　　　$= 30\sqrt{90}$ 　　　$= \boxed{12\sqrt{15} + 30\sqrt{35}}$
$= 48\cdot2\sqrt{5}$ 　　$= 30\sqrt{9}\sqrt{10}$
$= \boxed{96\sqrt{5}}$ 　　　$= \boxed{90\sqrt{10}}$

22. $3\sqrt{6}\left(2\sqrt{3} - 3\sqrt{2}\right)$ 　23. $\left(3 + \sqrt{2}\right)\left(5 - \sqrt{3}\right)$
$= 6\sqrt{18} - 9\sqrt{12}$ 　　　$= \boxed{15 - 3\sqrt{3} + 5\sqrt{2} - \sqrt{6}}$
$= 6\sqrt{9}\sqrt{2} - 9\sqrt{4}\sqrt{3}$
$= 6\cdot3\sqrt{2} - 9\cdot2\sqrt{3}$ 　24. $\left(4 - \sqrt{6}\right)\left(4 - \sqrt{6}\right)$
$= \boxed{18\sqrt{2} - 18\sqrt{3}}$ 　　$= 16 - 4\sqrt{6} - 4\sqrt{6} + \sqrt{36}$
　　　　　　　　　　　$= 16 - 8\sqrt{6} + 6$
25. $\left(4\sqrt{3} + 2\sqrt{6}\right)\left(4\sqrt{3} + 2\sqrt{6}\right)$ 　　$= \boxed{22 - 8\sqrt{6}}$
$= 16\cdot\sqrt{9} + 8\sqrt{18} + 8\sqrt{18} + 4\sqrt{36}$ 　　26. $\boxed{139.88}$
$= 16\cdot3 + 16\sqrt{18} + 4\cdot6$
$= 48 + 16\sqrt{9}\sqrt{2} + 24$
$= 72 + 16\cdot3\sqrt{2}$
$= \boxed{72 + 48\sqrt{2}}$

BASIC ALGEBRA Exam 5B*   Name_____

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
TURN IN **ALL** WORKSHEETS. CALCULATORS ARE REQUIRED ON THIS TEST.

In 1 - 25, simplify each radical completely. Leave answers in radical form.

1. $\sqrt{8}$

2. $\sqrt{28}$

3. $\sqrt{63}$

4. $\sqrt{500}$

5. $\sqrt{98}$

6. $\sqrt[3]{125}$

7. $\sqrt[3]{16}$

8. $\sqrt[3]{54}$

9. $\sqrt[3]{80}$

10. $\sqrt{x^{10}}$

11. $\sqrt{x^{11}}$

12. $\sqrt[3]{x^{12}}$

13. $\sqrt{x^5 y^8}$

14. $\sqrt{12x^7 y^{13}}$

15. $\sqrt{72x^6 y^{10}}$

16. $\sqrt{6} + \sqrt{6}$

17. $\sqrt{8} + \sqrt{18}$

18. $\sqrt{20} + \sqrt{125}$

19. $4\sqrt{27} + 6\sqrt{75}$

20. $3\sqrt{28} - 4\sqrt{175}$

21. $4\sqrt{3} \cdot 5\sqrt{2}$

22. $4\sqrt{3} \cdot 5\sqrt{15}$

23. $\sqrt{5}\,(2\sqrt{3} + 4\sqrt{10})$

24. $3\sqrt{2}\,(2\sqrt{3} - 3\sqrt{2})$

In 25 - 26, find the simplified radical form, then calculate the decimal value to nearest hundredth.

25. $(4 + \sqrt{2})(3 - \sqrt{2})$

26. $(3\sqrt{6} - 2\sqrt{3})^2$

BASIC ALGEBRA EXAM 5B* Solutions

1. $\sqrt{8}$
$\sqrt{4}\sqrt{2}$
$\boxed{2\sqrt{2}}$

2. $\sqrt{28}$
$\sqrt{4}\sqrt{7}$
$\boxed{2\sqrt{7}}$

3. $\sqrt{63}$
$\sqrt{9}\sqrt{7}$
$\boxed{3\sqrt{7}}$

4. $\sqrt{500}$
$\sqrt{100}\sqrt{5}$
$\boxed{10\sqrt{5}}$

5. $\sqrt{98}$
$\sqrt{49}\sqrt{2}$
$\boxed{7\sqrt{2}}$

6. $\sqrt[3]{125}$
$\boxed{5}$

7. $\sqrt[3]{16}$
$\sqrt[3]{8}\sqrt[3]{2}$
$\boxed{2\sqrt[3]{2}}$

8. $\sqrt[3]{54}$
$\sqrt[3]{27}\sqrt[3]{2}$
$\boxed{3\sqrt[3]{2}}$

9. $\sqrt[3]{80}$
$\sqrt[3]{8}\sqrt[3]{10}$
$\boxed{2\sqrt[3]{10}}$

10. $\sqrt{x^{10}}$
$\boxed{x^5}$

11. $\sqrt{x^{11}}$
$\sqrt{x^{10}}\sqrt{x}$
$\boxed{x^5\sqrt{x}}$

12. $\sqrt[3]{x^{12}}$
$\boxed{x^4}$

13. $\sqrt{x^5 y^9}$
$\sqrt{x^4 y^8}\sqrt{x}$
$\boxed{x^2 y^4 \sqrt{x}}$

14. $\sqrt{12x^7 y^{13}}$
$\sqrt{4x^6 y^{12}}\sqrt{3xy}$
$\boxed{2x^3 y^6 \sqrt{3xy}}$

15. $\sqrt{72x^6 y^{10}}$
$\sqrt{36x^6 y^{10}}\sqrt{2}$
$\boxed{6x^3 y^5 \sqrt{2}}$

16. $1\sqrt{6} + 1\sqrt{6}$
$\boxed{2\sqrt{6}}$

17. $\sqrt{8} + \sqrt{18}$
$\sqrt{4}\sqrt{2} + \sqrt{9}\sqrt{2}$
$2\sqrt{2} + 3\sqrt{2}$
$\boxed{5\sqrt{2}}$

18. $\sqrt{20} + \sqrt{125}$
$\sqrt{4}\sqrt{5} + \sqrt{25}\sqrt{5}$
$2\sqrt{5} + 5\sqrt{5}$
$\boxed{7\sqrt{5}}$

19. $4\sqrt{27} + 6\sqrt{75}$
$4\sqrt{9}\sqrt{3} + 6\sqrt{25}\cdot\sqrt{3}$
$4\cdot 3\sqrt{3} + 6\cdot 5\sqrt{3}$
$12\sqrt{3} + 30\sqrt{3}$
$\boxed{42\sqrt{3}}$

20. $3\sqrt{28} - 4\sqrt{175}$
$3\sqrt{4}\sqrt{7} - 4\cdot\sqrt{25}\sqrt{7}$
$3\cdot 2\sqrt{7} - 4\cdot 5\sqrt{7}$
$6\sqrt{7} - 20\sqrt{7}$
$\boxed{-14\sqrt{7}}$

21. $4\sqrt{3}\cdot 5\sqrt{2}$
$\boxed{20\sqrt{6}}$

22. $4\sqrt{3} \quad 5\sqrt{15}$
$20\sqrt{45}$
$20\sqrt{9}\cdot\sqrt{5}$
$20\cdot 3\sqrt{5}$
$\boxed{60\sqrt{5}}$

23. $\sqrt{5}(2\sqrt{3} + 4\sqrt{10})$
$2\sqrt{15} + 4\sqrt{50}$
$2\sqrt{15} + 4\sqrt{25}\sqrt{2}$
$\boxed{2\sqrt{15} + 20\sqrt{2}}$

24. $3\sqrt{2}(2\sqrt{3} - 3\sqrt{2})$
$6\sqrt{6} - 9\sqrt{4}$
$6\sqrt{6} - 9\cdot 2$
$\boxed{6\sqrt{6} - 18}$

25. $(4 + \sqrt{2})(3 - \sqrt{2})$
$12 - 4\sqrt{2} + 3\sqrt{2} - \sqrt{4}$
$12 - \sqrt{2} - 2$
$\boxed{10 - \sqrt{2}} \approx \boxed{8.59}$
$(4 + \sqrt{2})(3 - \sqrt{2}) \approx \boxed{8.59}$

26. $(3\sqrt{6} - 2\sqrt{3})(3\sqrt{6} - 2\sqrt{3})$
$9\sqrt{36} - 6\sqrt{18} - 6\sqrt{18} + 4\sqrt{9}$
$9\cdot 6 \quad - 12\sqrt{18} + 4\cdot 3$
$54 \quad - 12\sqrt{9}\sqrt{2} + 12$
$\boxed{66 - 36\sqrt{2}} \approx \boxed{15.09}$
$(3\sqrt{6} - 2\sqrt{3})^2 \approx \boxed{15.09}$