Radicals: variables, products and conjugates worksheet – Grade 9

Grade 9 · Mixed level · 20 questions · **Version X9706**

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1. Simplify $\sqrt{50x^2}$, where x is positive.
   A. $10x$ **B.** $5x\sqrt{2}$ **C.** $5x^2\sqrt{2}$ **D.** $5\sqrt{2x}$

2. A square patio has an area of 216 m². What is its exact side length?
   A. $6\sqrt{6}$ m **B.** 36 m **C.** $36\sqrt{6}$ m

3. Simplify $\sqrt{20x^4y^2}$, where x and y are positive.
   A. $2xy\sqrt{5}$ **B.** $10x^2y$ **C.** $2x^2y\sqrt{5}$ **D.** $2x^4y^2\sqrt{5}$

4. Work out $2\sqrt{5} \times 3\sqrt{5}$.
   A. 30 **B.** $6\sqrt{5}$ **C.** 6 **D.** $5\sqrt{5}$

5. Simplify $\sqrt{28x^4y^2}$, where x and y are positive.
   A. $2x^4y^2\sqrt{7}$ **B.** $2xy\sqrt{7}$ **C.** $14x^2y$ **D.** $2x^2y\sqrt{7}$

6. A square patio has an area of 32 m². What is its exact side length?
   A. $4\sqrt{2}$ m **B.** $16\sqrt{2}$ m **C.** $2\sqrt{4}$ m **D.** 8 m

7. Work out $5\sqrt{6} \times 7\sqrt{6}$.
   A. $35\sqrt{6}$ **B.** 35 **C.** 210 **D.** $12\sqrt{6}$

8. Expand and simplify $(6+\sqrt{5})(6-\sqrt{5})$.
   A. 12 **B.** 31 **C.** $36-12\sqrt{5}$ **D.** 41

9. Simplify $\sqrt{8}+\sqrt{50}$.
   A. $\sqrt{58}$ **B.** $10\sqrt{2}$ **C.** $7\sqrt{4}$ **D.** $7\sqrt{2}$

10. A rectangular garden is $2\sqrt{7}$ m by $5\sqrt{7}$ m. What is its exact area?
    A. 70 m² **B.** $7\sqrt{7}$ m² **C.** $10\sqrt{7}$ m² **D.** 10 m²

11. Simplify: $\sqrt{98}+\sqrt{18}$.
    A. $10\sqrt{2}$ **B.** $10\sqrt{4}$ **C.** $\sqrt{116}$ **D.** $21\sqrt{2}$

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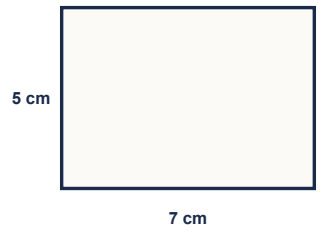
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12. Work out $4\sqrt{3} \times 3\sqrt{5}$.
A. 180 **B.** $7\sqrt{15}$ **C.** $12\sqrt{8}$ **D.** $12\sqrt{15}$

13. Write $\sqrt{28} + \sqrt{28}$ in simplest form.
A. $4\sqrt{14}$ **B.** $\sqrt{56}$ **C.** $4\sqrt{7}$

14. A rectangular garden is $4\sqrt{6}$ m by $6\sqrt{6}$ m. What is its exact area?
A. $144\ \text{m}^2$ **B.** $24\sqrt{6}\ \text{m}^2$ **C.** $24\ \text{m}^2$ **D.** $10\sqrt{6}\ \text{m}^2$

15. Find the exact perimeter of a rectangle $3\sqrt{7}$ cm by $5\sqrt{28}$ cm.



A. $26\sqrt{7}\ \text{cm}$ **B.** $26\sqrt{14}\ \text{cm}$ **C.** $13\sqrt{7}\ \text{cm}$ **D.** $16\sqrt{7}\ \text{cm}$

16. Simplify $\dfrac{\sqrt{180x^5}}{\sqrt{5x}}$, where x is positive.
A. $36x^2$ **B.** $6x^2$ **C.** $6x\sqrt{x}$ **D.** $6x^4$

17. Rationalize and simplify $\dfrac{46}{7+\sqrt{3}}$.
A. 46 **B.** $7-\sqrt{3}$ **C.** $7+\sqrt{3}$ **D.** $322-\sqrt{3}$

18. Expand $(\sqrt{7}+\sqrt{11})^2$.
A. $18+\sqrt{77}$ **B.** $18+2\sqrt{77}$ **C.** 18 **D.** $77+2\sqrt{18}$

19. A right triangle has legs $6\sqrt{7}$ and $4\sqrt{7}$. What is the exact hypotenuse?
A. $10\sqrt{7}$ **B.** 70 **C.** $2\sqrt{91}$ **D.** $24\sqrt{14}$

20. Multiply out $(\sqrt{2}+\sqrt{3})^2$.
A. $6+2\sqrt{5}$ **B.** 5 **C.** $5+2\sqrt{6}$ **D.** $5+\sqrt{6}$

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Answer key · Version X9706

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1. **B (**$5x\sqrt{2}$**)**
2. **A (**$6\sqrt{6}\ \mathrm{m}$**)**
3. **C (**$2x^2y\sqrt{5}$**)**
4. **A (30)**
5. **D (**$2x^2y\sqrt{7}$**)**
6. **A (**$4\sqrt{2}\ \mathrm{m}$**)**
7. **C (210)**
8. **B (31)**
9. **D (**$7\sqrt{2}$**)**
10. **A (**$70\ \mathrm{m}^2$**)**
11. **A (**$10\sqrt{2}$**)**
12. **D (**$12\sqrt{15}$**)**
13. **C (**$4\sqrt{7}$**)**
14. **A (**$144\ \mathrm{m}^2$**)**
15. **A (**$26\sqrt{7}\ \mathrm{cm}$**)**
16. **B (**$6x^2$**)**
17. **B (**$7-\sqrt{3}$**)**
18. **B (**$18+2\sqrt{77}$**)**
19. **C (**$2\sqrt{91}$**)**
20. **C (**$5+2\sqrt{6}$**)**

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