Radical expressions: harder worksheet – Grade 10

Grade 10 · Mixed level · 20 questions · **Version X2215**

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1. Expand and simplify $\sqrt{5}(6+\sqrt{5})$.
   A. $6\sqrt{5}+5$ **B.** $11\sqrt{5}$ **C.** 11 **D.** $6\sqrt{5}+25$

2. Multiply out $\sqrt{3}(3+\sqrt{3})$.
   A. $3\sqrt{3}+9$ **B.** $3\sqrt{3}+3$ **C.** $6\sqrt{3}$ **D.** 6

3. Simplify: $\sqrt{360}+\sqrt{360}-\sqrt{360}$.
   A. $6\sqrt{10}$ **B.** $36\sqrt{10}$ **C.** $\sqrt{360}$ **D.** $18\sqrt{10}$

4. Write $\sqrt{245}+\sqrt{20}-\sqrt{20}$ in simplest form.
   A. $\sqrt{245}$ **B.** $14\sqrt{5}$ **C.** $7\sqrt{5}$ **D.** $11\sqrt{5}$

5. Simplify $\sqrt{108}+\sqrt{27}-\sqrt{108}$.
   A. $15\sqrt{3}$ **B.** $\sqrt{27}$ **C.** $3\sqrt{3}$ **D.** $18\sqrt{3}$

6. A square has side $2\sqrt{11}$ m. What is its exact diagonal?
   A. $4\sqrt{11}$ m **B.** $2\sqrt{22}$ m **C.** $2\sqrt{13}$ m **D.** 44 m

7. A square has side $6\sqrt{3}$ m. What is its exact diagonal?
   A. $6\sqrt{6}$ m **B.** $12\sqrt{3}$ m **C.** $6\sqrt{5}$ m **D.** 108 m

8. Multiply out $(6\sqrt{5}+7)^2$.
   A. 229 **B.** $229+84\sqrt{5}$ **C.** $229+42\sqrt{5}$ **D.** $180+49$

9. Expand and simplify $(\sqrt{6}+\sqrt{2})(\sqrt{6}-\sqrt{2})$.
   A. $\sqrt{12}$ **B.** 4 **C.** $6+2\sqrt{12}+2$ **D.** 8

10. Rationalize $\dfrac{34}{6-\sqrt{2}}$.
    A. $6+\sqrt{2}$ **B.** $34(6+\sqrt{2})$ **C.** $6-\sqrt{2}$ **D.** 34

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11. Expand and simplify $(2+2\sqrt{3})(2-2\sqrt{3})$.

A. 4 **B.** $4-4\sqrt{3}$ **C.** 16 **D.** -8

12. Rationalize $\dfrac{39}{7-\sqrt{10}}$.

A. $7-\sqrt{10}$ **B.** 39 **C.** $7+\sqrt{10}$ **D.** $39(7+\sqrt{10})$

13. Multiply out $(2\sqrt{6}+4)^2$.

A. 40 **B.** $24+16$ **C.** $40+8\sqrt{6}$ **D.** $40+16\sqrt{6}$

14. Expand and simplify $(5\sqrt{2}+6)^2$.

A. 86 **B.** $50+36$ **C.** $86+60\sqrt{2}$ **D.** $86+30\sqrt{2}$

15. Solve $x^2-10x+15=0$ with the quadratic formula.

A. $x=5\pm\sqrt{10}$ **B.** $x=\pm\sqrt{10}$ **C.** $x=5\pm10$ **D.** $x=10\pm\sqrt{10}$

16. Solve $x^2=18$, exactly.

A. $x=9\sqrt{2}$ **B.** $x=\pm6$ **C.** $x=\pm3\sqrt{2}$ **D.** $x=3\sqrt{2}$

17. A rectangle is $(5+\sqrt{7})$ m by $(5-\sqrt{7})$ m. What is its exact area?

A. $25\ \text{m}^2$ **B.** $10\ \text{m}^2$ **C.** $32\ \text{m}^2$ **D.** $18\ \text{m}^2$

18. What is $(3+\sqrt{6})^2+(3-\sqrt{6})^2$?

Answer: _____

19. What is $(2+\sqrt{6})^2+(2-\sqrt{6})^2$?

Answer: _____

20. Solve $x^2-14x+47=0$ with the quadratic formula.

A. $x=7\pm2$ **B.** $x=\pm\sqrt{2}$ **C.** $x=7\pm\sqrt{2}$ **D.** $x=14\pm\sqrt{2}$

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Answer key · Version X2215

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1. **A (**$6\sqrt{5}+5$**)**
2. **B (**$3\sqrt{3}+3$**)**
3. **A (**$6\sqrt{10}$**)**
4. **C (**$7\sqrt{5}$**)**
5. **C (**$3\sqrt{3}$**)**
6. **B (**$2\sqrt{22}\ \mathrm{m}$**)**
7. **A (**$6\sqrt{6}\ \mathrm{m}$**)**
8. **B (**$229+84\sqrt{5}$**)**
9. **B (4)**
10. **A (**$6+\sqrt{2}$**)**
11. **D (**-8**)**
12. **C (**$7+\sqrt{10}$**)**
13. **D (**$40+16\sqrt{6}$**)**
14. **C (**$86+60\sqrt{2}$**)**
15. **A (**$x=5\pm\sqrt{10}$**)**
16. **C (**$x=\pm3\sqrt{2}$**)**
17. **D (**$18\ \mathrm{m}^2$**)**
18. **30**
19. **20**
20. **C (**$x=7\pm\sqrt{2}$**)**

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