## N.RN.A.2: Operations with Radicals 3

1  The expression $\left(2 - 3\sqrt{x}\right)^2$ is equivalent to

  1)  $4 - 9x$
  2)  $4 - 3x$
  3)  $4 - 12\sqrt{x} + 9x$
  4)  $4 - 12\sqrt{x} + 6x$

2  Simplify: $(\sqrt{x} - \sqrt{y})^2$

3  Simplify: $(2\sqrt{a} - b)(a + 2\sqrt{b})$

4  Simplify: $\left(\dfrac{x+1}{x-1}\sqrt{\dfrac{x-1}{x+1}}\right)\left(\sqrt{x^2 - 1}\right)$

5  Simplify: $\sqrt{\dfrac{a}{b}} \times \sqrt{\dfrac{b}{a}}$

6  Simplify: $\sqrt{\dfrac{a^2 b}{c}} \times \sqrt{\dfrac{a^2 c^3}{b}}$

7  Express $\dfrac{\sqrt{108x^5 y^8}}{\sqrt{6xy^5}}$ in simplest radical form.

8  Simplify: $\dfrac{3}{x-y}\sqrt{\dfrac{2a}{x-y}} \div \sqrt{\dfrac{18a^3}{(x-y)^5}}$

9  Simplify: $\sqrt{a} + 2\sqrt{ab^2}$

10  Simplify: $2ax\sqrt{45} + ax\sqrt{20}$

11  Simplify: $\sqrt{20a^3} + \sqrt{45a^5}$

12  Express $5\sqrt{3x^3} - 2\sqrt{27x^3}$ in simplest radical form.

13  Find the sum of $\sqrt{12a^3}$ and $\sqrt{27a^5 b^2}$.

14  Simplify: $3\sqrt{242x^5 y^5} + 11xy\sqrt{2x^3 y^3}$

15  The expression $4ab\sqrt{2b} - 3a\sqrt{18b^3} + 7ab\sqrt{6b}$ is
    equivalent to
    1)  $2ab\sqrt{6b}$
    2)  $16ab\sqrt{2b}$
    3)  $-5ab + 7ab\sqrt{6b}$
    4)  $-5ab\sqrt{2b} + 7ab\sqrt{6b}$

21  The legs of a right triangle are represented by
    $x + \sqrt{2}$ and $x - \sqrt{2}$. The length of the hypotenuse
    of the right triangle is represented by
    1)  $\sqrt{2x^2 + 4}$
    2)  $2x^2 + 4$
    3)  $x\sqrt{2} + 2$
    4)  $\sqrt{x^2 - 2}$

16  Simplify:  $\sqrt{\dfrac{a}{2}} + \dfrac{\sqrt{2a}}{2}$

22  Simplify:  $\dfrac{\sqrt{x} - \sqrt{x-2}}{\sqrt{x} + \sqrt{x-2}}$

17  Simplify:  $b\sqrt{a} - a^2 b^2 \sqrt{\dfrac{1}{ab^2}} + \sqrt{a^3 b^2}$

18  Simplify:  $\sqrt{9x^5 + 18x^4 y} - \sqrt{4xy^6 + 8y^7}$

19  The expression $\dfrac{1}{3}\sqrt{6}\left(3m\sqrt{2} - k\sqrt{3}\right)$ is
    equivalent to
    1)  $2m\sqrt{3} - k\sqrt{2}$
    2)  $2m\sqrt{3} - 3k\sqrt{2}$
    3)  $2m - k\sqrt{2}$
    4)  $12m - k\sqrt{6}$

20  Express $y\sqrt{3} - \left(\sqrt{32} + y\sqrt{27}\right)$ in simplest
    radical form.

# N.RN.A.2: Operations with Radicals 3
## Answer Section

1  ANS: 3        REF: 061407a2
2  ANS:

$x - 2\sqrt{xy} + y$

REF: 039309al
3  ANS:

$2a\sqrt{a} + 4\sqrt{ab} - ab - 2b\sqrt{b}$

REF: 090404al
4  ANS:

$x + 1$

REF: 019911al
5  ANS:

1

REF: 089312al
6  ANS:

$a^2 c$

REF: 099911al
7  ANS:

$$\frac{\sqrt{108x^5 y^8}}{\sqrt{6xy^5}} = \sqrt{18x^4 y^3} = 3x^2 y\sqrt{2y}$$

REF: 011133a2
8  ANS:

$$\frac{(x - y)}{a}$$

REF: 069709al
9  ANS:

$(2b + 1)\sqrt{a}$

REF: 099511al
10  ANS:

$8ax\sqrt{5}$

REF: 089312al

11 ANS:

$(2a + 3a^2)\sqrt{5a}$

REF: 119313al

12 ANS:

$5\sqrt{3x^3} - 2\sqrt{27x^3} = 5\sqrt{x^2}\sqrt{3x} - 2\sqrt{9x^2}\sqrt{3x} = 5x\sqrt{3x} - 6x\sqrt{3x} = -x\sqrt{3x}$

REF: 061032a2

13 ANS:

$(2a + 3a^2 b)(\sqrt{3a})$

REF: 119209al

14 ANS:

$44x^2 y^2 \sqrt{2xy}$

REF: 019111al

15 ANS: 4

$4ab\sqrt{2b} - 3a\sqrt{9b^2}\sqrt{2b} + 7ab\sqrt{6b} = 4ab\sqrt{2b} - 9ab\sqrt{2b} + 7ab\sqrt{6b} = -5ab\sqrt{2b} + 7ab\sqrt{6b}$

REF: fall0918a2

16 ANS:

$\sqrt{2a}$

REF: 119411al

17 ANS:

$b\sqrt{a}$

REF: 060505al

18 ANS:

$(3x^2 - 2y^3)\sqrt{x + 2y}$

REF: 069709al

19 ANS: 1

$\frac{1}{3}\sqrt{6}\left(3m\sqrt{2} - k\sqrt{3}\right) = m\sqrt{12} - \frac{k}{3}\sqrt{18} = 2m\sqrt{3} - k\sqrt{2}$

REF: 011710a2

20 ANS:

$y\sqrt{3} - 4\sqrt{2} - 3y\sqrt{3} = -2y\sqrt{3} - 4\sqrt{2}$

REF: 081436ia

21 ANS: 1

$$c = \sqrt{\left(x + \sqrt{2}\right)^2 + \left(x - \sqrt{2}\right)^2} = \sqrt{x^2 + 2\sqrt{2}x + 2 + x^2 - 2\sqrt{2}x + 2} = \sqrt{2x^2 + 4}$$

REF: 011626a2

22 ANS:

$$x - 1 - \sqrt{x^2 - 2x}$$

REF: 030504al