Review Questions for Exam 11
Algebra 2

1. Express $\sqrt{18} + 5\sqrt{2}$ in simplest radical form.

1. $8\sqrt{2}$
2. $2\sqrt{2}$
3. $6\sqrt{3}$
4. $6\sqrt{18}$

$\sqrt{9}\sqrt{2}$

$= 3\sqrt{2} + 5\sqrt{2} = 8\sqrt{2}$

2. The expression $\sqrt{18} + \sqrt{32}$ is equivalent to

1. $2\sqrt{7}$
2. $5\sqrt{2}$
3. $7\sqrt{2}$
4. $13\sqrt{2}$

$\sqrt{9}\sqrt{2} + \sqrt{16}\sqrt{2}$

$= 3\sqrt{2} + 4\sqrt{2}$

$= 7\sqrt{2}$

3. What is the sum of $4\sqrt{12}$ and $2\sqrt{27}$ in simplest form?

1. $5\sqrt{3}$
2. $6\sqrt{39}$
3. $11\sqrt{3}$
4. $14\sqrt{3}$

$= 4\sqrt{4}\sqrt{3} + 2\sqrt{9}\sqrt{3}$

$= 8\sqrt{3} + 6\sqrt{3} = 14\sqrt{3}$

4. The expression $\frac{2+\sqrt{3}}{2-\sqrt{3}}$ is equivalent to

1. $11\sqrt{3}$
2. $7-4\sqrt{3}$
3. $7+4\sqrt{3}$
4. $\frac{7+4\sqrt{3}}{7}$

$$\frac{(2+\sqrt{3})(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} = \frac{4+2\sqrt{3}+2\sqrt{3}+3}{4+2\sqrt{3}-2\sqrt{3}-3}$$

$$= \frac{7+4\sqrt{3}}{1}$$

5. The expression $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ is equal to

1. -1
2. 2
3. $2+\sqrt{3}$
4. $5+\sqrt{3}$

$$\frac{(\sqrt{3}+1)(\sqrt{3}+1)}{(\sqrt{3}-1)(\sqrt{3}+1)}$$

$$= \frac{3+\sqrt{3}+\sqrt{3}+1}{3+\sqrt{3}-\sqrt{3}-1} = \frac{4+2\sqrt{3}}{2}$$

$$= 2+\sqrt{3}$$

6. Express $\frac{5}{4-\sqrt{13}}$ as an equivalent fraction with a rational denominator.

1. $20+5\sqrt{13}$
2. $20-5\sqrt{13}$
3. $\frac{20+5\sqrt{13}}{3}$
4. $\frac{20+5\sqrt{13}}{29}$

$$\frac{5(4+\sqrt{13})}{(4-\sqrt{13})(4+\sqrt{13})}$$

conjugate pair

$$16+4\sqrt{13}-4\sqrt{13}-13=3$$

$$\frac{20+5\sqrt{13}}{3}$$

7. If $x > 0$, the expression $(\sqrt{x})(\sqrt{2x})$ is equivalent to

1. $\sqrt{2x}$
2. $2x$
3. $x^2\sqrt{2}$
4. $x\sqrt{2}$

$= \sqrt{2x^2} = x\sqrt{2}$

8. Simplify: $\sqrt{50r^2s^4}$

1. $5rs^2\sqrt{2}$
2. $25rs$
3. $5\sqrt{2}+rs^2$
4. $5rs^2$

$= \sqrt{25 \cdot 2 \cdot r^2 \cdot s^2 s^2}$

$= 5rs^2\sqrt{2}$

9. If $a > 0$, then $\sqrt{9a^2 + 16a^2}$ equals

1. $\sqrt{7a}$
2. $5\sqrt{a}$
3. $5a$
4. $7a$

$= \sqrt{25a^2}$

$= 5a$

10. Which expression is equivalent to $\dfrac{\sqrt{7}+\sqrt{2}}{\sqrt{7}-\sqrt{2}}$?

1. $\dfrac{9}{5}$
2. -1
3. $\dfrac{9+2\sqrt{14}}{5}$
4. $\dfrac{11+\sqrt{2}}{14}$

$$\frac{(\sqrt{7}+\sqrt{2})(\sqrt{7}+\sqrt{2})}{(\sqrt{7}-\sqrt{2})(\sqrt{7}+\sqrt{2})} = \frac{7+\sqrt{14}+\sqrt{14}+2}{7+\sqrt{14}-\sqrt{14}-2} = \frac{9+2\sqrt{14}}{5}$$

11. Simplify the expression: $\sqrt{5}\left(\sqrt{10}+2\sqrt{5}\right)$

1. $10+5\sqrt{2}$
2. $5+10\sqrt{2}$
3. $15\sqrt{2}$
4. $\sqrt{15}+2\sqrt{10}$

$= \sqrt{50}+2\sqrt{25}$

$= \sqrt{25 \cdot 2}+2 \cdot 5$

$= 5\sqrt{2}+10$

12. Simplify the expression: $3\sqrt{2}\left(\sqrt{6}-2\sqrt{2}\right)$

1. $3\sqrt{3}-12$
2. $3\sqrt{3}+12$
3. $6\sqrt{3}-12$
4. $6\sqrt{3}+12$

$= 3\sqrt{12}-6\sqrt{4}$

$= 3 \cdot 2\sqrt{3}-12$

$= 6\sqrt{3}-12$

13. Simplify the expression: $\sqrt{8}\left(\sqrt{2}+\sqrt{18}\right)$

1. $4\sqrt{10}$
2. 16
3. $16\sqrt{2}$
4. $4+3\sqrt{2}$

$=\sqrt{16}+\sqrt{8\cdot 18}$

8·18

4 2 4 2

$=4+\sqrt{2^2\cdot 2^2\cdot 3^2}$

2 2 3

$=4+12=16$

14. Simplify the expression: $\sqrt{3}\left(\sqrt{6}+\sqrt{8}\right)$

1. $\sqrt{18}+\sqrt{24}$
2. $\sqrt{36}$
3. 6
4. $3\sqrt{2}+2\sqrt{6}$

$= \sqrt{18}+\sqrt{24}$

$= \sqrt{9\cdot 2}+\sqrt{4\cdot 6}$

$= 3\sqrt{2}+2\sqrt{6}$

15. Simplify the expression: $2\sqrt{y}\left(\sqrt{8y^2}+\sqrt{6}\right)$

1. $4y\sqrt{2y}+12\sqrt{y}$
2. $2y\sqrt{2y}-2\sqrt{6y}$
3. $4y\sqrt{2y}+2\sqrt{6y}$
4. $2y\sqrt{-4y}$

$= 2\sqrt{8y^3}+2\sqrt{6y}$

$= 2\sqrt{4\cdot 2\cdot y^2 y}+2\sqrt{6y}$

$= 4y\sqrt{2y}+2\sqrt{6y}$

16. Simplify the expression: $\sqrt{x^2y}\left(2x\sqrt{y}-3\sqrt{x^2y}\right)$

1. $-x^2y$
2. x^2y
3. $-5x^2y$
4. $-6x^4y^2$

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

$= 2x \cdot xy - 3x^2y$

$= 2x^2y - 3x^2y = -x^2y$

17. Simplify the expression: $(2+\sqrt{2})(\sqrt{2}-4)$

1. $-6+2\sqrt{2}$
2. $-6-2\sqrt{2}$
3. $6+2\sqrt{2}$
4. $6-2\sqrt{2}$

$= 2\sqrt{2} - 8 + 2 - 4\sqrt{2}$

$= -6 - 2\sqrt{2}$

18. Simplify the expression: $\left(4\sqrt{3}-2\right)^2$

1. $8\sqrt{3}$
2. $-8\sqrt{3}$
3. $52-16\sqrt{3}$
4. $52+16\sqrt{3}$

$=(4\sqrt{3}-2)(4\sqrt{3}-2)$

$=16\cdot 3-8\sqrt{3}-8\sqrt{3}+4$

$=52-16\sqrt{3}$

19. Simplify the expression: $(3+\sqrt{5})^2$

1. $14 + 6\sqrt{5}$
2. $14 - \sqrt{5}$
3. 14
4. 4

$= (3+\sqrt{5})(3+\sqrt{5})$

$= 9 + 3\sqrt{5} + 3\sqrt{5} + 5$

$= 14 + 6\sqrt{5}$

20. Simplify the expression: $6\sqrt{8} \cdot 2\sqrt{2}$

1. $12\sqrt{16}$
2. $\sqrt{192}$
3. 24
4. 48

$= 12\sqrt{16}$

$= 12 \cdot 4 = 48$

21. Simplify the expression: $5\sqrt{r} \cdot \sqrt{rs}$

1. $5r\sqrt{s}$
2. $5\sqrt{r^2s}$
3. $5\sqrt{2rs}$
4. $5rs$

$= 5\sqrt{r^2s}$

$= 5r\sqrt{s}$

22. Simplify the expression: $3x\sqrt{90x^2} \cdot y\sqrt{2y^2}$

1. $18xy\sqrt{5}$
2. $18xy\sqrt{5xy}$
3. $18x^2y^2\sqrt{5}$
4. $18x^3y^3\sqrt{5}$

$= 3xy\sqrt{90 \cdot 2x^2y^2}$

$= 3xy\sqrt{9 \cdot 10 \cdot 2x^2y^2}$

$= 9x^2y^2\sqrt{20}$

$= 9x^2y^2\sqrt{4 \cdot 5}$

$= 18x^2y^2\sqrt{5}$