WARM UP

Simplify the following expression.

$$5\sqrt{3} + \sqrt{12} - \sqrt{48} + 2\sqrt{75}$$

$$5\sqrt{3} + \sqrt{4}\sqrt{3} - \sqrt{16}\sqrt{3} + 2\sqrt{25}\sqrt{3}$$

$$5\sqrt{3} + 2\sqrt{3} - 4\sqrt{3} + \overset{10}{2\cdot 5}\sqrt{3}$$

$$\boxed{13\sqrt{3}}$$

<u>**Pre-Calculus 110**</u>
<u>**Exam Review**</u>
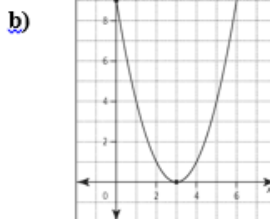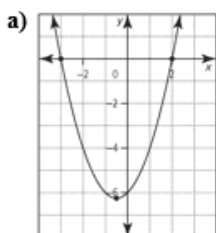
<u>**June 5, 2019: Day #3**</u>

1. Exam Review

Jan 29-9:28 AM

Suggestions for studying...

1. **Do review**
2. **If you get stuck, look over class examples**
3. **Look over old quizzes.**
4. **Look over old tests.**
5. **Ask questions (to each other and me)**
6. **Extra help**

Jan 15-9:23 AM

Unit 3: Quadratic Equations

1. How many x-intercepts does the graph of each quadratic function have?

a)

b)

2. What are the roots of the quadratic equations graphed in #1?

3. Solve by using a graphing calculator.

a) $0 = -a^2 - 3a - 4$ b) $12 = -3b^2 - 12b$

4. Determine the roots for each quadratic equation using a graphing calculator. Where integral roots cannot be found, estimate the roots to the nearest tenth.

a) $0 = x^2 + 2.4x - 3.85$ b) $t^2 + t = -1$

5. For what values of m would the equation $x^2 + 8x + m = 0$ have

     a) one real root or two equal real roots?

     b) two real distinct roots?

     c) no real roots?

6. An object is launched at 21.5 m/s from a height of 2.4 m. The equation for the object's height, h, measured in metres, t seconds after launch is $h = -4.9t^2 + 21.5t + 2.4$. After how many seconds will the object hit the ground? Express your answer to the nearest tenth of a second. Use a graphing calculator to solve.

$$-4.9t^2 + 21.5t + 2.4 = 0$$

7. Factor.

    a) $x^2 - x - 20$ **b)** $3x^2 - 30x + 63$ **c)** $-4x^2 - 12x - 8$ **d)** $\frac{1}{2}x^2 - \frac{1}{2}x - 6$

    e) $14x^2 + 3x - 5$ **f)** $3x^2 + 11x - 20$ **g)** $4x^2 + 7xy + 3y^2$ **h)** $6x^2 - 17x + 12$

    i) $12x^2 - 4xy - 8y^2$ **k)** $140x^2 - 450xy + 250y^2$ **l)** $x^2 - 49y^2$ **m)** $25x^2 - 9$

    n) $x^2 - \frac{25}{4}y^2$ **o)** $(x+1)^2 - (x-7)^2$ **p)** $(x-1)^2 - 2(x-1) - 35$

    q) $6(2x+1)^2 - 7(2x+1) - 20$ **r)** $2(7x)^2 + 2(7x) - 24$

8. Solve each quadratic equation by factoring. Verify your answer.

    a) $x^2 - 2x - 15 = 0$ **b)** $2x^2 + 8x = 64$ **c)** $\frac{1}{2}x^2 - \frac{9}{2}x + 9 = 0$ **d)** $7x^2 - 35 = 0$

9. Determine the real roots of each quadratic equation.

    a) $64x^2 - 169 = 0$ **b)** $(x+1)^2 - 81 = 0$

10. Two numbers have a sum of 22. What are the numbers if their product is 96?

11. Use the discriminant to determine the nature of the roots for each quadratic equation. Do not solve the equation.

    a) $7x^2 + x - 1 = 0$ **b)** $3x^2 - 4x + 5 = 0$ **c)** $8y^2 - 8y + 2 = 0$ **d)** $3x^2 + 6 = 0$

12. Without graphing, determine the number of zeros for each quadratic function.

    a) $f(x) = 3x^2 - 2x + 9$ **b)** $g(x) = 9x^2 - 30x + 25$ **c)** $h(t) = -4.9t^2 - 5t + 50$

13. Use the quadratic formula to solve each quadratic equation. Express answers as exact values in simplest form.

    a) $x^2 - 10x + 23 = 0$ **b)** $4x^2 - 28x + 46 = 0$

14. Use the quadratic formula to solve each quadratic equation. Express answers to the nearest hundredth.

 a) $6x^2 - 5x + 1 = 0$ **b)** $-3x^2 + 5x + 4 = 0$

15. For the quadratic equation $2x^2 + kx - 2 = 0$, one root is 2.

 a) Determine the value of k.

 b) What is the other root?

Unit 4: Radical Expressions and Equations

1. Express each radical as a simplified mixed radical.

    a) $\sqrt{54}$ **b)** $\sqrt{350}$ **c)** $\sqrt{363x^5 y^3}$, $x \geq 0$, $y \geq 0$

2. Express each mixed radical as an equivalent entire radical.

    a) $4\sqrt{5}$ **b)** $23\sqrt{13}$ **c)** $9x^2\sqrt{x}$, $x \geq 0$ **d)** $5xy\sqrt{7y}$, $x \geq 0$, $y \geq 0$

3. Simplify each expression.
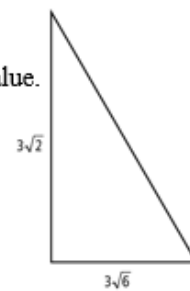
    a) $7\sqrt{11} - 3\sqrt{11} + 8\sqrt{11}$ **b)** $4\sqrt{3x} - 4\sqrt{2} + \sqrt{3x} - \sqrt{2}$

4. Simplify each expression.

a) $3\sqrt{20d} + 5\sqrt{45d}$ b) $\sqrt{10e} - \sqrt{90e} + 4\sqrt{40e}$ c) $5\sqrt{3} + \sqrt{12} - \sqrt{48} + 2\sqrt{75}$

d) $x^2\sqrt{16y} + 3\sqrt{x^4 y}$

5. What is the perimeter of the right triangle shown? State the answer as an exact value.

$3\sqrt{2}$

$3\sqrt{6}$

6. Multiply. Express each answer as a mixed radical in simplest form.

a) $\left(6\sqrt{5}\right)\left(2\sqrt{3}\right)$ b) $\left(3\sqrt{28}\right)\left(\frac{1}{4}\sqrt{14}\right)$ c) $\left(\sqrt{27x^5}\right)\left(\sqrt{3x^7}\right)$

7. Simplify each expression.

a) $\sqrt{10}\left(2\sqrt{10} + \sqrt{5}\right)$ b) $3\sqrt{x}\left(2\sqrt{x} - \sqrt{2}\right)$

8. Multiply using the distributive property. Simplify each expression.

a) $\left(3 + 4\sqrt{7}\right)\left(5\sqrt{7} + 2\right)$ b) $\left(4\sqrt{3} + 3\sqrt{5}\right)^2$

9. Divide. Express each answer in simplest form.

a) $\dfrac{\sqrt{20}}{\sqrt{5}}$ b) $\dfrac{x\sqrt{18x^3}}{4\sqrt{6x}}, x > 0$

$$(3 + 4\sqrt{7})(5\sqrt{7} + 2)$$

$$15\sqrt{7} + 6 + 20\sqrt{49} + 8\sqrt{7}$$

$$140$$

$$\boxed{23\sqrt{7} + 146}$$

10. Rationalize each denominator. Express each radical in simplest form.

a) $\dfrac{\sqrt{10}}{\sqrt{3}}$

b) $\dfrac{\sqrt{3}-1}{\sqrt{3}}$

d) $\dfrac{6\sqrt{2}+2\sqrt{6}}{3\sqrt{6}}$

d) $\dfrac{4}{\sqrt{3}+1}$

e) $\dfrac{2\sqrt{2}-\sqrt{6}}{2\sqrt{6}-\sqrt{5}}$

11. Solve for missing variable in each equation.

a) $\sqrt{x+3}=7$

b) $\sqrt{y^2+1}-y=1$

c) $\sqrt{4-3m}=m$

d) $\sqrt{x+5}=\sqrt{2x-3}$

e) $\sqrt{w+1}=\sqrt{w+4}$

f) $\sqrt{x-5}-\sqrt{x+10}=-3$

12. John solves the equation $\sqrt{x+6}-x=4$. He determines two solutions: $x=-2$ and $x=-5$. Identify whether either of these values is extraneous.

$$\sqrt{x-5}-\sqrt{x+10}=-3$$

$$\left(\sqrt{x-5}\right)^2=\left(\sqrt{x+10}-3\right)^2 \qquad \left(\sqrt{x+10}-3\right)\left(\sqrt{x+10}-3\right)$$

$$x-5 = x+10-3\sqrt{x+10}-3\sqrt{x+10}+9$$

$$\dfrac{-24}{-6}=\dfrac{-6\sqrt{x+10}}{-6}$$

$$(4)^2=\left(\sqrt{x+10}\right)^2$$

$$16=x+10$$

$$\boxed{x=6}$$

Unit 5: Rational Expressions and Equations

1. Determine the non-permissible value(s) for each rational expression.

a) $\dfrac{5}{x+3}$ b) $\dfrac{7}{xy}$ c) $\dfrac{x+3}{(x+4)(x-5)}$ d) $\dfrac{1-x}{3x+5}$

2. Simplify each rational expression. State any non-permissible values.

a) $\dfrac{3(x+5)}{(x+5)(x-5)}$ b) $\dfrac{(x-7)(x+2)}{-5x(7-x)}$ c) $\dfrac{(x+3)^2}{3(x+3)(x-3)}$ d) $\dfrac{25(x-5)(x+1)}{10(2x+1)(x-5)}$

3. Simplify. State any non-permissible values.

a) $\dfrac{6r^2 st}{10rs^2 t^2}$ b) $\dfrac{3x-6}{x^2-4}$ c) $\dfrac{2x^2+5x+2}{5x^2-5x-30}$

4. Simplify.

a) $\left(\dfrac{9x}{14y^2}\right)\left(\dfrac{7y^3}{3x^2}\right)$

b) $\left[\dfrac{(x+1)(x-6)}{(x-6)(x+6)}\right]\left[\dfrac{x(x+6)}{(1+x)}\right]$

5. Write each product in simplest form.

a) $\left(\dfrac{x-2}{x^2-4}\right)\left(\dfrac{x^2-2x-8}{x+2}\right)$

b) $\left(\dfrac{5y-5}{y^2+4y-5}\right)\left(\dfrac{y^2-25}{y^2-2y-15}\right)$

6. Divide. Express each quotient in simplest form.

a) $\left(\dfrac{5a}{3b}\right)\div\left(\dfrac{15c}{9a^2}\right)$

b) $\left(\dfrac{x+1}{3x+5}\right)\div\left(\dfrac{x+3}{3x+5}\right)$

7. What are the non-permissible values for

the quotient $\dfrac{x^2+8x+16}{(x-3)(x+5)}\div\dfrac{3x^2-3}{(x+4)}$. Explain your answer.

8. Simplify each quotient.

a) $\dfrac{x-x^2}{10x+8}\div\dfrac{(x-1)^2}{5x^2+4x}$

b) $\dfrac{x^2+8x+7}{x^2-6x-7}\div\dfrac{x^2+7x+6}{x^2-x-42}$

9. State the least common denominator.

a) $\dfrac{9x+y}{4x} + \dfrac{3y}{5y}$ b) $\dfrac{1}{x+4} - \dfrac{5}{5x+1}$ c) $\dfrac{9}{x^2-36} + \dfrac{3x}{x-6}$

10. Add or subtract. Express the answers in simplest form.

a) $\dfrac{x+1}{3x} + \dfrac{4x-5}{3x}$ b) $\dfrac{4x^2}{x+5} + \dfrac{x+1}{x+5} - \dfrac{x^2}{x+5}$

11. Simplify.

a) $\dfrac{x-4}{3xy} - \dfrac{3x+1}{y^2}$ b) $\dfrac{3}{x-5} + \dfrac{2}{x+7}$ c) $\dfrac{5x}{x+1} - \dfrac{x^2+4}{(x+1)(x-1)} + \dfrac{3}{x-1}$

12. Simplify.

a) $\dfrac{2a}{2a+6} - \dfrac{a^2+9}{a^2-9}$ b) $\dfrac{3y}{y^2-4} + \dfrac{6y}{y^2+5y+6}$ c) $\dfrac{x-6}{x^2-11x+28} - \dfrac{x-5}{x^2-8x+7}$

13. Solve and check each equation.

a) $\dfrac{2x}{3} = \dfrac{x}{4} + \dfrac{5}{6}$ b) $\dfrac{3}{x+3} = \dfrac{x+15}{x+3} - 5$ c) $\dfrac{2}{x-3} + \dfrac{3}{x} = 2$

d) $\dfrac{x+1}{x-3} = \dfrac{x}{x-5}$ e) $\dfrac{x}{x-3} + \dfrac{x^2+9}{x^2-9} = \dfrac{2x}{x+3}$ f) $\dfrac{x+5}{2x+4} = \dfrac{x}{x-3} - \dfrac{2x+9}{x^2-x-6}$

14. John's family travels 300 km from their home to a family reunion. His cousin Susan and her family take the same amount of time to travel 200 km from their home. Determine the speed of both vehicles given that one of the vehicles travels 30 km/h faster than the other.

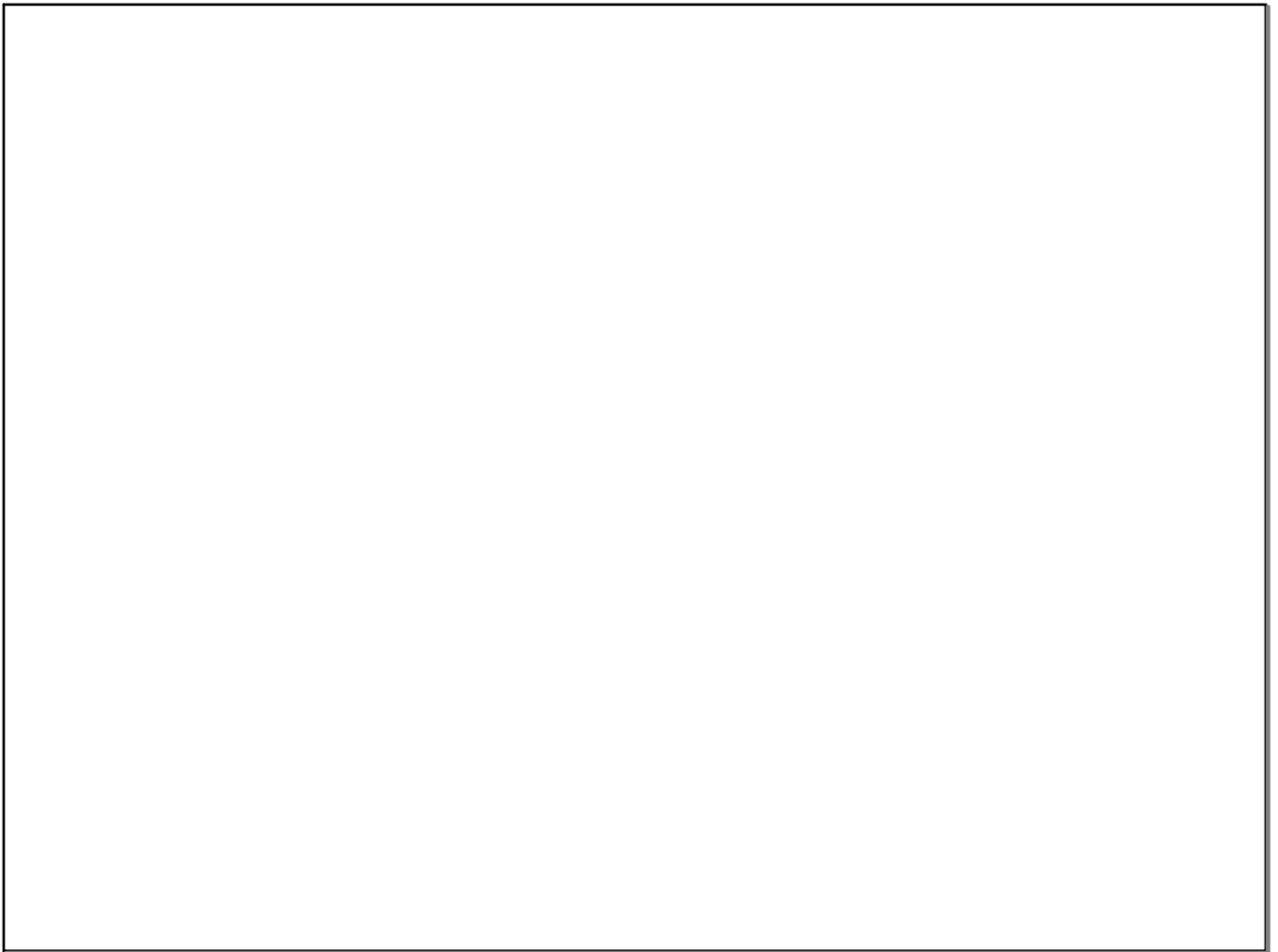|	D	U	t
John	300	X+30	$\dfrac{300}{X+30}$
Susan	200	X	$\dfrac{200}{X}$

$$\dfrac{300}{X+30} = \dfrac{200}{X}$$

$$300x = 200(x+30)$$

$$300x = 200x + 6000$$

$$100x = 6000$$

$$\boxed{X = 60 \, Km/hr}$$

14. John's family travels 300 km from their home to a family reunion. His cousin Susan and her family take the same amount of time to travel 200 km from their home. Determine the speed of both vehicles given that one of the vehicles travels 30 km/h faster than the other.

Attachments

Standard Form Demor.GSP

Warm ups.notebook