Barnett

Algebra 2
Honors

Packets 11-16

Instructional Packet #11 Show all Work.

Algebra 2 Honors Name_____ ID: 1

Test - Quadratic Functions

Solve each equation by taking square roots.

1) $9k^2 + 1 = -80$

A) $\{4\sqrt{6}, -4\sqrt{6}\}$ B) $\left\{\frac{\sqrt{7}}{2}\right\}$

C) $\{2, -2\}$ D) $\{3i, -3i\}$

2) $64x^2 + 6 = 55$

A) $\{\sqrt{11}\}$ B) $\{3\}$

C) $\left\{\frac{7}{8}, -\frac{7}{8}\right\}$ D) $\{3, -3\}$

Solve each equation by factoring.

3) $3a^2 - 4a - 15 = 0$

A) $\left\{\frac{5}{3}, -2\right\}$ B) $\left\{-\frac{5}{3}, 3\right\}$

C) $\left\{-\frac{4}{7}, -\frac{7}{3}\right\}$ D) $\left\{-\frac{7}{5}, \frac{4}{7}\right\}$

4) $4k^2 + 16k + 7 = 0$

A) $\left\{-\frac{1}{2}, -\frac{7}{2}\right\}$ B) $\left\{\frac{1}{2}, \frac{7}{2}\right\}$

C) $\left\{-\frac{4}{3}, 2\right\}$ D) $\left\{\frac{1}{2}, 0\right\}$

Solve each equation with the quadratic formula.

5) $9n^2 + 2n - 17 = 0$

A) $\{-1 + 3\sqrt{2}, -1 - 3\sqrt{2}\}$

B) $\left\{\frac{1 + \sqrt{154}}{9}, \frac{1 - \sqrt{154}}{9}\right\}$

C) $\left\{\frac{-1 + \sqrt{154}}{9}, \frac{-1 - \sqrt{154}}{9}\right\}$

D) $\left\{\frac{-2 + \sqrt{157}}{18}, \frac{-2 - \sqrt{157}}{18}\right\}$

6) $6r^2 - 7r - 5 = 0$

A) $\left\{\frac{5}{3}, -\frac{1}{2}\right\}$

B) $\left\{\frac{7 + i\sqrt{71}}{12}, \frac{7 - i\sqrt{71}}{12}\right\}$

C) $\{-1 + i\sqrt{10}, -1 - i\sqrt{10}\}$

D) $\left\{\frac{-1 + i\sqrt{43}}{4}, \frac{-1 - i\sqrt{43}}{4}\right\}$

Solve each equation by any method.

7) $b^2 + 6b - 7 = 0$

A) $\{1, -7\}$

B) $\{4, -20\}$

C) $\{10 + \sqrt{21}, 10 - \sqrt{21}\}$

D) $\{-7 + \sqrt{6}, -7 - \sqrt{6}\}$

8) $m^2 - 10m - 93 = 0$

A) $\{2, -18\}$

B) $\{5, -15\}$

C) $\{5 + \sqrt{118}, 5 - \sqrt{118}\}$

D) $\{22, -4\}$

Instructional Packet # 12 (page 1 of 2)

Test - page 2 Show all work.

Solve each equation using any method.

9) $6x^2 + 2 = 218$

10) $64r^2 - 5 = 59$

11) $m^2 = m + 12$

12) $n^2 + 4n = 5$

13) $6x^2 + 5x = -8$

14) $7n^2 + 2n = -3$

15) $2n^2 = -7n + 11$

16) $2x^2 + 6 = 9x$

17) $k^2 + 2k - 44 = 0$

Instructional Packet #12 cont.

Test - page 3

You must write an equation and show your work.

18. The length of a rectangle is 3 centimeters more than the width. The area is 108 square centimeters. Find the length and width of the rectangle.

Length _____ width _____

19. The length of a rectangle is 7 meters less than twice the width. Find the dimensions if the area is 60 square meters.

Length _____ width _____

20. The product of two positive consecutive odd integers is 399. Find the integers.

_____ and _____

EXTRA CREDIT

A. Find three consecutive integers such that three times the sum of all three equals the product of the larger two.

B. The hypotenuse of a right triangle is 3 less than twice the shorter leg. The length of the other leg is 3 more than the shorter leg. Find the length of the hypotenuse.

Simplifying Rational Expressions Notes

Steps:
1. Factor top and bottom completely.
2. Cancel out like factors on top and bottom.
3. Write answer with factors that remain.

① $\frac{a+10}{7a+70}$

① Factor

$\frac{a+10}{7(a+10)}$

② Cancel like factors

$\frac{\cancel{a+10}}{7(\cancel{a+10})}$

③ Placeholder of 1 on top

$\frac{1}{7}$

② $\frac{m^2-11m+30}{m-6}$

① Factor

$\frac{(m-6)(m-5)}{m-6}$

② Cancel

$\frac{\cancel{(m-6)}(m-5)}{\cancel{m-6}}$

③ Answer

$\boxed{m-5}$

③ $\frac{3n^2+18n}{9n^2+54n}$

Factor $\frac{3n(n+6)}{9n(n+6)}$

Cancel $\frac{3\cancel{n}\cancel{(n+6)}}{9\cancel{n}\cancel{(n+6)}}$

Reduce $\frac{3}{9} = \boxed{\frac{1}{3}}$

④ $\frac{2m^2-10m}{m^2+4m-45}$

Factor $\frac{2m(m-5)}{(m-5)(m+9)}$

Cancel $\frac{2m\cancel{(m-5)}}{\cancel{(m-5)}(m+9)}$

$\boxed{\frac{2m}{m+9}}$

Simplifying Rational Expressions Notes Continued

⑤ $\dfrac{3r^3+33r^2+54r}{r^2+14r+45}$

$\dfrac{3r(r^2+11r+18)}{r^2+14r+45}$

$\dfrac{3r(r+2)(r+9)}{(r+5)(r+9)}$

$\dfrac{3r(r+2)(\cancel{r+9})}{(r+5)(\cancel{r+9})}$

$\boxed{\dfrac{3r(r+2)}{r+5}}$

⑥ $\dfrac{3n^2-30n+27}{n^3-13n^2+36n}$

$\dfrac{3(n^2-10n+9)}{n(n^2-13n+36)}$

$\dfrac{3(n-1)(n-9)}{n(n-4)(n-9)}$

$\dfrac{3(n-1)(\cancel{n-9})}{n(n-4)(\cancel{n-9})}$

$\boxed{\dfrac{3(n-1)}{n(n-4)}}$

Simplifying Rational Expressions Video (Packets 13 and 14)

https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:cancel-common-factor/v/simplifying-rational-expressions-introduction

You can ignore the exclusions. Just work on getting the rational expression simplified.

Multiplying Rational Expressions Video (Packets 15 and 16)

https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-mul-div/v/multiplying-and-dividing-rational-expressions-2

You can ignore the domain and constraints. Just work on getting the rational expressions simplified.

Packet #13

What Happened To the Guy Who Jumped From a 100-foot Tower Into a Large Glass of Root Beer?

Simplify the expression, then find your answer. Write the letter of the answer in each box with the exercise number. If the answer has a ●, shade in the box instead of writing a letter in it.

1. $\frac{3x+12}{x+4}$

2. $\frac{x-5}{8x-40}$

3. $\frac{x^2-9}{x+3}$

4. $\frac{x^2-49}{3x-21}$

5. $\frac{x^2+2x}{x^2-9x}$

6. $\frac{a^2+8a+15}{a^2+7a+10}$

7. $\frac{a^2+4a-12}{a^2-5a+6}$

8. $\frac{a^2+9a+20}{a^2-25}$

9. $\frac{5a-15}{a^2+5a-24}$

10. $\frac{a-9}{a^2-9a}$

11. $\frac{2n^3+8n^2}{5n^2+20n}$

12. $\frac{n^2-9n+14}{3n^2-12}$

13. $\frac{6n^2+18n}{2n^3-18n}$

14. $\frac{n^2-5n-36}{n^2+8n+16}$

15. $\frac{2n^2+7n+5}{6n^3+15n^2}$

Answers 1-5

S $x-3$ | V $\frac{x+2}{x-3}$

B $\frac{x-7}{7}$ | G 3

O $\frac{1}{8}$ | I $\frac{x+7}{3}$

● $\frac{x+2}{x-9}$ | Y $\frac{x+3}{3}$

Answers 6-10

P $\frac{5}{a-3}$ | H $\frac{a+4}{a-5}$

K $\frac{a+3}{a+2}$ | R $\frac{1}{a}$

● $\frac{5}{a+8}$ | C $\frac{a+4}{a}$

U $\frac{a+3}{a-5}$ | A $\frac{a+6}{a-3}$

Answers 11-15

F $\frac{n-9}{n+4}$ | D $\frac{n-7}{3(n+2)}$

L $\frac{n+1}{n-3}$ | ● $\frac{2n}{n+2}$

T $\frac{3}{n-3}$ | N $\frac{n+1}{3n^2}$

W $\frac{2n}{5}$ | E $\frac{n-2}{n+3}$

15	2	13	8	4	15	1	9	4	13	5	11	7	3	5	7	9	3	2	14	13	9	12	10	4	15	6

12-1

NAME Packet #14 DATE

Practice

Student Edition
Pages 660–665

Simplifying Rational Expressions

Simplify each rational expression. State the excluded values of the variables.

1. $\frac{12a}{48a^3}$

2. $\frac{4x^2y^2}{16yx^3}$

3. $\frac{6abc^3}{3a^2b^2}$

4. $\frac{n+6}{3(n+6)}$

5. $\frac{-2w^3}{w(w^2+4)}$

6. $\frac{z+1}{(z+1)(z-1)}$

7. $\frac{(c+5)(c-5)}{(c-5)(c+2)}$

8. $\frac{-1(2r-3)}{(r+3)(2r-3)}$

9. $\frac{a^2-b^2}{a-b}$

10. $\frac{4x-4}{4x+4}$

11. $\frac{3a+15}{a^2-25}$

12. $\frac{t^2+5t+6}{t^2+6t+8}$

13. $\frac{3s^2-27}{s^2+7s+12}$

14. $\frac{7k^4}{5k^3-2k^2}$

15. $\frac{m^2-4m-12}{m-6}$

16. $\frac{v^2+3v-4}{v^2+2v-8}$

17. $\frac{5z^2+5z-30}{7z^2+7z-42}$

18. $\frac{p^2+p-2}{p^4-5p^2+4}$

Multiplying Rational Expressions Notes

Steps:

1. Factor top and bottom of both fractions completely
2. Make into fraction by putting tops together and bottoms together.
3. Cancel out like factors on top and bottom.
4. Write answer with factors that remain.

① $\frac{6}{42n-30} \cdot \frac{14n-10}{n+3}$

Factor $\frac{6}{6(7n-5)} \cdot \frac{2(7n-5)}{(n+3)}$

Put together $\frac{6 \cdot 2(7n-5)}{6(7n-5)(n+3)}$

Cancel $\frac{\cancel{6} \cdot 2(\cancel{7n-5})}{\cancel{6}(\cancel{7n-5})(n+3)}$

$$\boxed{\frac{2}{n+3}}$$

② $\frac{6m+9}{5m^2} \cdot \frac{6m}{12m^2+18m}$

$\frac{3(2m+3)}{5m^2} \cdot \frac{6m}{6m(2m+3)}$

$\frac{3(2m+3) \cdot 6m}{5m^2 \cdot 6m(2m+3)}$

$\frac{3(\cancel{2m+3}) \cdot \cancel{6m}}{5m^2 \cdot \cancel{6m}(\cancel{2m+3})}$

$$\boxed{\frac{3}{5m^2}}$$

Multiplying Rational Expressions Notes Continued

③ $\frac{v^2+3v-28}{v^2-64} \cdot \frac{1}{v+7}$

Factor $\frac{(v+7)(v-4)}{(v+8)(v-8)} \cdot \frac{1}{(v+7)}$

Put together $\frac{(v+7)(v-4)}{(v+8)(v-8)(v+7)}$

Cancel $\frac{\cancel{(v+7)}(v-4)}{(v+8)(v-8)\cancel{(v+7)}}$

$$\boxed{\frac{v-4}{(v+8)(v-8)}}$$

④ $\frac{x-8}{56x} \cdot \frac{x^2+14x+48}{x^2-64}$

$\frac{(x-8)}{56x} \cdot \frac{(x+8)(x+6)}{(x+8)(x-8)}$

$\frac{(x-8)(x+8)(x+6)}{56x(x+8)(x-8)}$

$\frac{\cancel{(x-8)}\cancel{(x+8)}(x+6)}{56x\cancel{(x+8)}\cancel{(x-8)}}$

$$\boxed{\frac{x+6}{56x}}$$

Packet #15

What Is the Difference Between a Barbell and an Ocean?

Express the product in simplest form. Cross out the letters above each correct answer. Write the letters that remain in the spaces at the bottom of the page.

1. $\frac{7x}{4} \cdot \frac{16}{5x^3}$

2. $\frac{9x^5}{x-3} \cdot \frac{x+3}{6x^2}$

3. $\frac{2x-10}{x+4} \cdot \frac{x^2-16}{x-5}$

4. $\frac{x^2+5x+6}{8x^4} \cdot \frac{15x}{7x+21}$

5. $\frac{x^2+3x-10}{x^2-7x+10} \cdot \frac{x^2-25}{5x}$

6. $\frac{x^2-8x}{10x^3} \cdot \frac{4x}{x^2-11x+24}$

7. $\frac{7}{c^2-49} \cdot \frac{c+7}{c-7}$

8. $\frac{8c^3}{3c^2+30c} \cdot \frac{c^2+7c-30}{24c}$

9. $\frac{c-1}{c+5} \cdot \frac{2c^2+11c+5}{c^2-1}$

10. $\frac{c^2-c-12}{6c^3} \cdot \frac{15c}{c^2+6c+9}$

11. $\frac{5c+45}{10c+45} \cdot \frac{4c^2-81}{c+9}$

12. $\frac{c^2-8c+16}{4} \cdot \frac{12c^2-36c}{9c^2-36c}$

TH $2(x-4)$	**AT** $\frac{2c+1}{c+1}$	**WE** $\frac{5(c+4)}{2c^3(c+3)}$	**LL** $\frac{28}{5x^2}$	**AB** $\frac{(c-4)(c-3)}{3}$	**IG** $\frac{c^3(c+3)}{3}$
SO $\frac{2}{5x(x-3)}$	**HT** $\frac{(c-3)(c+8)}{4}$	**ON** $\frac{7}{(c-7)^2}$	**PL** $2c-9$	**AN** $\frac{4}{5x(x-4)}$	**TS** $\frac{(x+5)^2}{5x}$
DS $\frac{15(x+3)}{8x^3}$	**AT** $\frac{15(x+2)}{56x^3}$	**ON** $\frac{5(c-4)}{2c^2(c+3)}$	**TR** $\frac{3x^3(x+3)}{2(x-3)}$	**EA** $\frac{2c+1}{c(c-1)}$	**TS** $\frac{c(c-3)}{9}$

12-2

NAME Packet #16 DATE

Student Edition
Pages 667–670

Practice

Multiplying Rational Expressions

Find each product. Assume that no denominator has a value of 0.

1. $\frac{2a^2b}{b^2c} \cdot \frac{b}{a}$

2. $\frac{18x^2}{10y^2} \cdot \frac{15y^3}{24x}$

3. $\frac{24st^2}{8s^4t^3} \cdot \frac{12s^3t^2}{36s^2t}$

4. $\frac{12a^2b}{4} \cdot \frac{4a + 8b}{20a^2b^3}$

5. $\frac{12m - 18}{18n} \cdot \frac{9n^2}{8m - 12}$

6. $\frac{y^2 - 9}{4} \cdot \frac{8}{y + 3}$

7. $\frac{(x + 2)^2}{8} \cdot \frac{72}{x^2 - 4}$

8. $\frac{2a^2 + a}{4a^2 - 1} \cdot \frac{6a - 3}{4a}$

9. $\frac{5n + 15}{8n + 4} \cdot \frac{4n + 2}{3n + 9}$

10. $\frac{e^2 - 1}{2e - 6} \cdot \frac{e^2 - 9}{3e - 3}$

11. $\frac{k^2 - 4}{8k^2 + 3k} \cdot \frac{16k + 6}{k - 2}$

12. $\frac{4r + r^2}{8 + 2r} \cdot \frac{4}{2r^3}$

13. $\frac{25 - c^2}{12} \cdot \frac{4}{5 - c}$

14. $\frac{xy}{3x - 3y} \cdot \frac{x^2 - xy}{xy}$

15. $\frac{2c^2 - 5c - 3}{c + d} \cdot \frac{c^2 - d^2}{2c + 1}$

16. $\frac{t^2 + 6t + 9}{t^2 - 10t + 25} \cdot \frac{t^2 - t - 20}{t^2 + 7t + 12}$