

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) review all ideas for the unit summative.

(See Next Page)

*You may wish to print out 4.1.1
in advance of next class.*

(Done Fall 2019)
Correct Factoring Quiz

Correct Homework on Rearranging Formulae

7, 11, 12, 14, 10, 9
3.7.2 1-14, 1-18

3.7.3 2c,d,f, 3a,b,c

[Jump to Review Questions \(lesson\)](#)

3.7.2 Connecting Formulae Worksheet 1

Extra practiceMake x the subject of the following:

- 1 $3x + 1 = y$ 2 $12 - 2x = 4y + 2$ 3 $y = \frac{x+1}{2}$
- 4 $3 + 4y + 2x = 9$ 5 $2xy + 1 = 3y$ 6 $2(x+3) = 3(x+2y-1)$
- 7 $\frac{x-1}{y+2} = 3$ 8 $y = \frac{2}{x+1}$ 9 $\frac{3-x}{y} = x$
- 10 $\frac{3}{x-1} = 5y$ 11 $\frac{xy}{x+1} = 3$ 12 $y-3 = \frac{x}{2x+1}$
- 13 $z = x^2y + 3$ 14 $xyz = \frac{3b}{x}$ 15 $(x+1)^2 = 3ab + 1$
- 16 $y = \sqrt{(2x+3)}$ 17 $\frac{x-z}{2} = \frac{x+y}{3}$ 18 $y = \frac{1}{\sqrt{x}}$
- 19 $z^2 = x^2 + y^2$ 20 $2(x+3) - 3(y+2) = 4xy$ 21 $z = \sqrt{xy} + 1$
- 22 $\frac{x}{y+1} = \frac{n}{x^2y}$ 23 $\frac{x+3y}{z-2x} = 3$ 24 $\frac{(x-1)^2}{4} + (2y+1)^2 = 1$

Answers

- 1 $x = \frac{y-1}{3}$ 2 $x = 5 - 2y$ 3 $x = 2y - 1$
- 4 $x = 3 - 2y$ 5 $x = \frac{3y-1}{2y}$ 6 $x = 9 - 6y$
- 7 $x = 3y + 7$ 8 $x = \frac{2}{y} - 1$ 9 $x = \frac{3}{y+1}$
- 10 $x = \frac{3}{5y} + 1$ 11 $x = \frac{3}{y-3}$ 12 $x = \frac{3-y}{2y-7}$
- 13 $x = \sqrt{\frac{z-3}{y}}$ 14 $x = \sqrt{\frac{3b}{yz}}$ 15 $x = \sqrt{(3ab+1)} - 1$
- 16 $x = \frac{y^2-3}{2}$ 17 $x = 2y + 3z$ 18 $x = \frac{1}{y^2}$
- 19 $x = \sqrt{z^2 - y^2}$ 20 $x = \frac{3y}{2-4y}$ 21 $x = \frac{(z-1)^2}{y}$
- 22 $x = \sqrt[3]{\frac{n(y+1)}{y}}$ 23 $x = \frac{3(z-y)}{7}$ 24 $x = 2\sqrt{1 - (2y+1)^2} + 1$

$$\begin{aligned} \textcircled{7} \quad \frac{x-1}{y+2} &= 3 \\ x-1 &= 3(y+2) \\ x &= 3(y+2)+1 \\ x &= 3y+7 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad \frac{3}{x-1} &= 5y \\ 3 &= 5y(x-1) \\ 3 &= 5xy - 5y \\ \frac{3+5y}{5y} &= \frac{5xy}{5y} \\ \frac{3+5y}{5y} &= x \\ \text{or } \frac{3}{5y} + 1 &= x \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad y-3 &= \frac{x}{2x+1} \\ (2x+1)(y-3) &= x \\ 2xy - 6x + y - 3 &= x \\ 2xy - 6x - x &= 3 - y \\ 2xy - 7x &= 3 - y \\ x(2y-7) &= 3 - y \\ x &= \frac{3-y}{2y-7} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad \frac{3-x}{y} &= x \\ 3-x &= xy \\ 3 &= x+xy \quad -x = xy+3 \\ 3 &= x(1+y) \quad -x-xy = 3 \\ -x(1+y) &= -3 \\ -x &= \frac{-3}{1+y} \\ x &= \frac{3}{1+y} \quad \text{or } x = \frac{3}{y+1} \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad \frac{xy}{x+1} &= 3 \\ xy &= 3(x+1) \\ xy &= 3x+3 \\ xy-3x &= 3 \\ x(y-3) &= 3 \\ x &= \frac{3}{y-3} \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad xyz &= \frac{3b}{x} \\ x(xyz) &= x\left(\frac{3b}{x}\right) \\ x^2yz &= 3b \\ x^2 &= \frac{3b}{yz} \\ x &= \pm \sqrt{\frac{3b}{yz}} \end{aligned}$$

c) For $r = \frac{I}{Pt}$, find r when $I = 58.27$, $t = 5.4$, and $P = 500$.

$$\begin{aligned} r &= \frac{58.27}{500(5.4)} \\ &= 0.02158 \\ &= 2.158 \\ &= 2.16\% \end{aligned}$$

d) For $P = \frac{A}{(1+i)^n}$, find P when $A = 1500$, $i = 0.035$, and $n = 24$.

$$\begin{aligned} P &= \frac{1500}{(1+0.035)^{24}} \\ &= 656.935 \\ &= \$656.94 \end{aligned}$$

f) For $V = \frac{4}{3}\pi r^3$, find V when $r = 3.5$.

$$\begin{aligned} &= \frac{4}{3}\pi(3.5)^3 \\ &= 179.594 \\ &= 179.59 \end{aligned}$$

3.9.1 Review

Date: Oct. 21/191. Factor the following completely. Note: You are **NOT** solving for x .

a) $25x^8 - 30x^5 + 35x$

b) $144x^4 - 25z^2$

c) $7x(x+2) - 5(x+2)$

$$= 5x(5x^7 - 6x^4 + 7)$$

Check Solns

$$x^8 - 10x^4 - 24$$

d) $x^2 - 10x - 24$

e) $x^2 - 12x + 32$

f) $3x^2 - x - 30$

$$= (x-12)(x+2)$$

$$x^{10} - 10x^5 - 24$$

$$= (x^5 - 12)(x^5 + 2)$$

$$x^{10} + 2x^5 - 12x^5 - 24$$

$$= x^{10} - 10x^5 - 24$$

g) $7x^2 + x - 8$

h) $8x^2 - 5x - 3$

i) $x^4 - 3x^3 + 2x - 6$

j) $a^2 - 2a + ad - 2d$

k) $2x^4 - 98x^2$

1a) $5x(5x^7 - 6x^4 + 7)$ b) $(12x^2 - 5z)(12x^2 + 5z)$ c) $(7x-5)(x+2)$ d) $(x-12)(x+2)$

e) $(x-8)(x-4)$ f) $(3x-10)(x+3)$ g) $(7x+8)(x-1)$ h) $(8x+3)(x-1)$

i) $(x^3+2)(x-3)$ j) $(a+d)(a-2)$ k) $2x^2(x-7)(x+7)$

2. Solve. Factor and use the quadratic formula where needed.

a) $y^3 + y^2 + 2y + 2 = 0$

b) $16x^2 - 36 = 0$

c) $15x^2 + 3x - 12 = 0$

$$y^2(y+1) + 2(y+1) = 0$$

$$(y+1)(y^2+2) = 0$$

$$\downarrow$$
$$y+1=0$$

$$y = -1$$

$$\rightarrow y^2+2=0$$

$$y^2 = -2$$

$$y = \pm\sqrt{-2}$$

NO SOLN
Real

d) $2x^4 - 18x^2 = 0$

e) $x^3 - 3x^2 + 2x = 0$

f) $2x^4 - 20x^3 + 48x^2 = 0$

Check Solns

g) $2x^2 + 13x + 15 = 0$

h) $x^3 - 19 = 0$

i) $-4x^3 + 10x^2 - 2x = 0$

j) $x(x^2 - x - 2) = 14 - x(x + 2)$

k) $-4x^2 + 36 = -x^3 + 9x$

2a) $y = -1$ b) $x = \frac{-3}{2}, \frac{3}{2}$ c) $x = \frac{4}{5}, -1$ d) $x = 0, -3, 3$ e) $x = 0, 1, 2$ f) $x = 0, 6, 4$

g) $x = \frac{-3}{2}, -5$ h) $x \doteq 2.67$ i) $x = 0, x \doteq 2.28, x \doteq 0.22$ j) $x \doteq 2.41$ k) $x = -3, 3, 4$

3. Find each product.

a) $(4x + 5y)(8x - 9y)$

b) $(-6x - 3y)(-6x^2 - xy + 5y^2)$

Check Solns

c) $(x^2 - 3xy + 2y^2)(-2x^2 + 4xy + 5y^2)$

3a) $32x^2 + 4xy - 45y^2$ b) $36x^3 + 24x^2y - 27xy^2 - 15y^3$ c) $-2x^4 + 10x^3y - 11x^2y^2 - 7xy^3 + 10y^4$

4. Rearrange each formula.

a) Make x the subject of $5 + 8y + 4x = 33$

b) Make b the subject of $A = \frac{h(a+b)}{2}$

Check Solns

c) Make v the subject of $I = mv - mu$

d) Make x the subject of $\frac{x+3y}{z-2x} = 3$

e) Make x the subject of $(x+1)^2 = 4yz + 6$

$$x+1 = \pm \sqrt{4yz+6}$$

$$x = -1 \pm \sqrt{4yz+6}$$

4a) $x = -2y + 7$

b) $b = \frac{2A}{h} - a$

c) $v = \frac{I}{m} + u$

d) $x = \frac{3z - 3y}{7}$

e) $x = \pm \sqrt{4yz+6} - 1$

3.9.1: Review Solutions

1a) $5x(5x^2 - 6x^4 + 7)$ b) $(12x^2 - 5z)(12x^2 + 5z)$ c) $(7x - 5)(x + 2)$ d) $(x - 12)(x + 2)$

e) $(x - 8)(x - 4)$ f) $(3x - 10)(x + 3)$ g) $(7x + 8)(x - 1)$ h) $(8x + 3)(x - 1)$

i) $(x^3 + 2)(x - 3)$ j) $(a + d)(a - 2)$ k) $2x^2(x - 7)(x + 7)$

2a) $y = -1$ b) $x = \frac{-3}{2}, \frac{3}{2}$ c) $x = \frac{4}{5}, -1$ d) $x = 0, -3, 3$ e) $x = 0, 1, 2$ f) $x = 0, 6, 4$

g) $x = \frac{-3}{2}, -5$ h) $x \doteq 2.67$ i) $x = 0, x \doteq 2.28, x \doteq 0.22$ j) $x \doteq 2.41$ k) $x = -3, 3, 4$

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4a) $x = -2y + 7$ b) $b = \frac{2A}{h} - a$ c) $v = \frac{l}{m} + u$ d) $x = \frac{3z - 3y}{7}$ e) $x = \pm\sqrt{4yz + 6} - 1$

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