

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.

$$12 \quad y - 3 = \frac{x}{2x + 1}$$

$$(y - 3)(2x + 1) = x$$

$$2xy + y - 6x - 3 = x$$

$$2xy - 6x - x = 3 - y$$

$$2xy - 7x = 3 - y$$

$$x(2y - 7) = 3 - y$$

$$x = \frac{3 - y}{2y - 7} \quad \text{or} \quad x = \frac{-y + 3}{2y - 7}$$

$$14 \quad \text{Make } a \text{ the subject of } s = ut + \frac{1}{2}at^2$$

$$s - ut = \frac{1}{2}at^2$$

$$2(s - ut) = at^2$$

$$\frac{2(s - ut)}{t^2} = a$$

$$\frac{s - ut}{t^2} = \frac{1}{2}a$$

$$2\left(\frac{s - ut}{t^2}\right) = \cancel{2}\left(\frac{1}{2}a\right)$$

$$2\frac{(s - ut)}{t^2} = a$$

$$\frac{2s - 2ut}{t^2} = a$$

16 Make v the subject of $E = \frac{1}{2}cv^2$

$$\begin{aligned} & \downarrow \\ 2E &= cv^2 \\ \frac{2E}{c} &= v^2 \\ v &= \pm \sqrt{\frac{2E}{c}} \end{aligned}$$

$$\begin{aligned} \frac{4P}{9} &= Q^2 \\ \pm \sqrt{\frac{4P}{9}} &= Q \\ Q &= \frac{\pm 2\sqrt{P}}{3} \end{aligned}$$

18 Make C the subject of $F = \frac{2}{5}C + 32$

$$\begin{aligned} F - 32 &= \frac{2}{5}C \\ 5(F - 32) &= 2C \\ \frac{5}{2}(F - 32) &= C \end{aligned}$$

3.9.1 Review

Date: Oct. 22/181. Factor the following completely. Note: You are **NOT** solving for x .

$$\begin{array}{l} \text{a) } 25x^8 - 30x^5 + 35x \\ \text{b) } 144x^4 - 25z^2 \\ \text{c) } 7x(x+2) - 5(x+2) \end{array}$$

$$= 5x(5x^7 - 6x^4 + 7) = (12x^2 + 5z)(12x^2 - 5z) = (x+2)(7x-5)$$

Check Solns

$$\begin{array}{l} \text{d) } x^2 - 10x - 24 \\ \text{e) } x^2 - 12x + 32 \\ \text{f) } 3x^2 - x - 30 \end{array}$$

$$= (x-4)(x+6) = (x-4)(x-8) = 3x^2 - 10x + 9x - 30$$

$$= x(3x-10) + 3(3x-10)$$

$$= (3x-10)(x+3)$$

$$\begin{array}{l} \text{g) } 7x^2 + x - 8 \\ \text{h) } 8x^2 - 5x - 3 \\ \text{i) } x^4 - 3x^3 + 2x - 6 \end{array}$$

$$= 7x^2 + 8x - 7x - 8$$

$$= x(7x+8) - 1(7x+8)$$

$$= (7x+8)(x-1)$$

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

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

$$= 2x^2(x^2 - 49)$$

$$= 2x^2(x-7)(x+7)$$

$$\begin{array}{llll} \text{1a) } 5x(5x^7 - 6x^4 + 7) & \text{b) } (12x^2 - 5z)(12x^2 + 5z) & \text{c) } (7x-5)(x+2) & \text{d) } (x-12)(x+2) \\ \text{e) } (x-8)(x-4) & \text{f) } (3x-10)(x+3) & \text{g) } (7x+8)(x-1) & \text{h) } (8x+3)(x-1) \\ \text{i) } (x^3+2)(x-3) & \text{j) } (a+d)(a-2) & \text{k) } 2x^2(x-7)(x+7) & \end{array}$$

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

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

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

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

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

$\rightarrow y^2+2=0$
 $y^2=-2$
 $y = \pm\sqrt{-2}$
 No Real Solution.

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

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

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

$$x(x-2)(x-1) = 0$$

$\therefore x = 0, 2, 1$

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

20

$$3(5x^2 + x - 4) = 0$$

$$3(5x^2 + 5x - 4x - 4) = 0$$

$$3[5x(x+1) - 4(x+1)] = 0$$

$$3(x+1)(5x-4) = 0$$

\downarrow
 $\therefore x = -1$ $5x-4=0$
 $5x=4$
 $x = \frac{4}{5}$

Check Solns

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

$$2x^2(x^2 - 10x + 24) = 0$$

$$2x(x-6)(x-4) = 0$$

$\therefore x = 0, 6, 4$

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

$\begin{matrix} 1, 3, 0 \\ \rightarrow 2, 1, 5 \\ \rightarrow 3, 10 \\ \rightarrow 5, 6 \end{matrix}$
 $2x^2 + 3x + 10x + 15 = 0$

$$x(2x+3) + 5(2x+3) = 0$$

$$(2x+3)(x+5) = 0$$

$\therefore x = -\frac{3}{2}, -5$

h) $x^3 - 19 = 0$

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

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

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

$$x^3 - x^2 - 2x = 14 - x^2 - 2x$$

$$x^3 - x^2 - 2x + x^2 + 2x - 14 = 0$$

$$x^3 - 14 = 0$$

$$x^3 = 14$$

$$x = \sqrt[3]{14}$$

≈ 2.41

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) $x \approx 2.67$ i) $x = 0, x \approx 2.28, x \approx 0.22$ j) $x \approx 2.41$ 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 $I = mv - mu$

$$\begin{aligned} I + mu &= mv \\ \frac{I + mu}{m} &= v \\ \frac{I}{m} + \frac{mu}{m} &= v \\ \frac{I}{m} + u &= v \end{aligned} \quad \left\{ \begin{aligned} I &= m(v - u) \\ \frac{I}{m} &= v - u \\ \frac{I}{m} + u &= v \end{aligned} \right.$$

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

$$\begin{aligned} x + 3y &= 3(z - 2x) \\ x + 3y &= 3z - 6x \\ x + 6x &= 3z - 3y \\ 7x &= 3z - 3y \\ x &= \frac{3z - 3y}{7} \\ \text{or } x &= \frac{3(z - y)}{7} \end{aligned}$$

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

$$\begin{aligned} \sqrt{(x+1)^2} &= \pm \sqrt{4yz + 6} \\ x + 1 &= \pm \sqrt{4yz + 6} \\ x &= -1 \pm \sqrt{4yz + 6} \end{aligned}$$

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

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

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

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

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

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) $x = -3, 3, 4$

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

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

[Return to 1](#)[Return to 2](#)[Return to 3](#)[Return to 4](#)