MCS: 12-9-13

Test 4 : Wednesday 12-11.

- coverage secs. 4.8, 5.1 to 5.7, 6.1

  No 6.2 ⇒ see Quizzes 10, 11 and "problem 0" of Quiz 12.

- study Quizzes 10 and 11

  see solutions in the following notes; Quiz 10 and 11 solutions are on following page.

Note: correction to Quiz 11 ⇒

#1. should be under "section 5.1 practice"

12-9-13

* Quiz 12 ⇒ 6.3 - 6.6 ⇒ test 5
* Quiz 13 ⇒ 6.6, 6.7, 8.1, 8.6, 9.1, 9.3 } test 5
* Quiz 14 ⇒ 8.2 (?), 8.6, 9.1, 9.3 } reinforcement

test 5

Dec 16: Review Quiz 12, 13, 14

Test 4: (WED) 12-11-13

Q10, Q11

4.8, 5.1 — 5.7, 6.1.

6.2 NOT on Test 4.

Review TODAY.

Test 5 : 12-18-13 (WED)

→ ADD 8.2

Q12, Q13, Q14

OVERLAP

Review-Tonight IF time permits and 12-16-13

Quiz 10 and Quiz 11 solutions follow:

Quiz 10 Solutions

4.8

(1.) $\frac{1}{x^{-7}} = x^{7}$; $a^{-n} = \frac{1}{a^{n}}$

or $a^{n} = \frac{1}{a^{-n}}$

$$\boxed{\frac{1}{a^{-n}} = a^{n}}$$

(2.) $5^{-8} \cdot 5^{4} = 5^{(-8+4)}$

$= 5^{-4} = \frac{1}{5^{4}} = \frac{1}{5 \cdot 5 \cdot 5 \cdot 5}$

$= \frac{1}{25 \cdot 25}$

$= \frac{1}{625}$

Test 4 question?:

$2^{-8} \cdot 2^{4} = 2^{-8+4}$

$= 2^{-4} = \frac{1}{2^{4}}$

$= \frac{1}{2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{4 \cdot 4} = \frac{1}{16}$

Quiz 10

(3.)

$$\frac{12x^{-6}}{8y^{-10}} = \frac{3 \cdot y^{10}}{2 \cdot x^6} = \boxed{\frac{3y^{10}}{2x^6}}$$

$$\frac{12}{8} = \frac{3\cancel{4}}{\cancel{8}_2} = \frac{3}{2}$$

$$x^{-6} = \frac{1}{x^6}$$

$$\frac{1}{y^{-10}} = y^{10}$$

(4.) SCI. NOT. TO DECIMAL.

8.13×10^{4} = SCI. NOT.

$8.13 \times 10^{4} = 8.1300. = 81300.$

4 PLACES

$= 81300$

$= 81,300$

CLEAR COMMA

SCI. NOT. TO DECIMAL

(5.) 8.92×10^{-3} *

$= .00892$

3 left *

$= 0.00892$

PLACE HOLDER

(6.) DEC. TO SCI. NOT.:

2100. ← DECIMAL

= 2100.

WANT SCI. NOT.

⇒ 2100. = 2.1×10^3

← LEFT 3

ANSWER

CHECK: 2.1×10^3

$= 2.100. = 2100.$

$= 2100$

→

RULE: DECIMAL TO SCI. NOT.:

(A.) MOVE • LEFT OR RIGHT

(B.) IF • MOVES LEFT, EXPONENT IS POSITIVE.

(C.) IF • MOVES RIGHT, EXPONENT IS NEGATIVE

THINK IN OPPOSITES

DEC. TO SCI. NOT.:

(7.) 0.0814

$0.08.14 \times 10^{-2} = 8.14 \times 10^{-2}$

→ move right: 2 places; exponent is negative

(8.) 5.1

$6x^2 + 3x - 15 \rightarrow$ #20, 5.1

FIND G.C.F. = 3

$3 \cdot (2x^2 + x - 5)$ (OK)

TRY TO FACTOR BUT NOT NECESSARY

(9.) $x \cdot (x+5) + 3 \cdot (x+5)$

$= (x+5) \cdot (x + 3)$

Comment:

Ch 5.1 TRY # 43

ALSO, see Quiz 11, #1 and #7.

#43, sec 5.1: $x^3+2x^2+5x+10$

2 GROUPS $\longrightarrow$ $(x^3+2x^2)+(5x+10)$

$x^2\cdot(x+2)+5\cdot(x+2)$

$(x+2)\cdot(x^2+5)$

(see Quiz 11)
#1 and #7

FUN $x^3+2x^2+5x+10+6x+12$

$x^2\cdot(x+2)+5(x+2)+6\cdot(x+2)$

$=(x+2)\cdot(x^2+5+6)$

Quiz 10

5.2

(10) $x^2 + 9x + 20$

$= (x + A)(x + B)$

$= (x + 5)(x + 4)$

$= (x + 4)(x + 5)$ ALSO ANSWER

$A \cdot B = 20$

$A = 5$

$B = 4$

$A + B = 9$

(11) $x^2 - 5x + 6$

neg. neg. pos.

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

$A \cdot B = 6$

$A + B = 5$

$-A - B = -5$

(neg)(neg) = pos

QUIZ 10

(12) $x^2 + 2x - 8$

5.2

$= (x + A)(x - B)$

(Pos)(neg) = neg

$A = 4$ $\quad A \cdot B = 8$

$B = 2$ $\quad A - B = 2$

$\rightarrow (x+4)\cdot(x-2)$

CHECK: FOIL:

$\Rightarrow x^2 - 2x + 4x - 8$

Quiz 11 ~

5.1

(1.)

Sec 5.1 PRACTICE

CORRECTION

$x^3 - 3x^2 + 4x - 12$ ← see Quiz 10, #9 and section 5.1, #43

$(x^3 - 3x^2) + (4x - 12)$ ← factor by grouping.

$x^2 \cdot (x-3) + 4 \cdot (x-3)$

$(x-3) \cdot (x^2+4)$ = answer

$(x^2+4) \cdot (x-3)$

Quiz 11

5.3

(2)

$3x^2 + 4x + 1$

OBVIOUS: $1 \cdot 1 = 1$

Guess: $(3x+1)(x+1)$

OBVIOUS: $3x \cdot x = 3x^2$

Check: $(3x+1)(x+1)$

$\Rightarrow 3x^2 + 3x + x + 1$

F O I L

$\Rightarrow \boxed{3x^2 + 4x + 1}$

Quiz 11

(3.) $5x^2 + 18x + 9$

Guesses:

$5x^2 + 45x + x + 9 \Leftarrow (5x+1)(x+9)$ no

$\boxed{5x^2 + 15x + 3x + 9} \Leftarrow (5x+3)(x+3)$ yes

$5x^2 + 5x + 9x + 9 \Leftarrow (5x+9)\cdot(x+1)$ no

$14x$

5.4 (4.) $x^2 - 25 = x^2 - 5^2$

$= A^2 - B^2$

$= (A+B)(A-B)$

$= (x+5)(x-5)$

$= (x-5)\cdot(x+5)$

} Both are correct

5.

$x^4 - 16 = (x^2)^2 - 4^2$

$= (x^2)^2 - (4)^2$

$= (A)^2 - (B)^2$

$= (A+B)(A-B)$; $A = x^2$, $B = 4$

$= (x^2+4)(x^2-4)$

Factor this!

$x^2 - 4 = x^2 - 2^2$

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

$(x^2+4)(x+2)(x-2)$

$$x^4 - 16 = (x^2+4)(x^2-4)$$

x^4

still must factor x^2-4

$(x^2+4)(x^2-4)$ ← NOT FINISHED

$= (x^2+4)(x+2)(x-2)$

CANNOT be factored

$= \boxed{(x^2+4)(x+2)(x-2)}$ ANSWER

review

$x^2 + 4$ ← plus → PRIME (CANNOT BE FACTORED)

$x^2 - 4 = x^2 - 2^2 = (x+2)(x-2)$

↑ negative

5.5 Quiz 11

(6.) $5x^2 - 125$; GCF $= 5$

$\Rightarrow 5 \cdot (x^2 - 25)$; $5 \cdot 25 = 125$.

← FACTOR OUT 5

$\Rightarrow 5 \cdot (x^2 - 5^2)$

$= 5 \cdot (x+5)(x-5)$

Use: $x^2 - 5^2 = A^2 - B^2$

$= (A+B)(A-B)$

(7.) $x^3 + 3x^2 + 4x + 12$ ← see #43) Sec. 5.1

$(x^3 + 3x^2) + (4x + 12)$

$x^2 \cdot (x+3) + 4 \cdot (x+3) = (x+3)(x^2+4)$

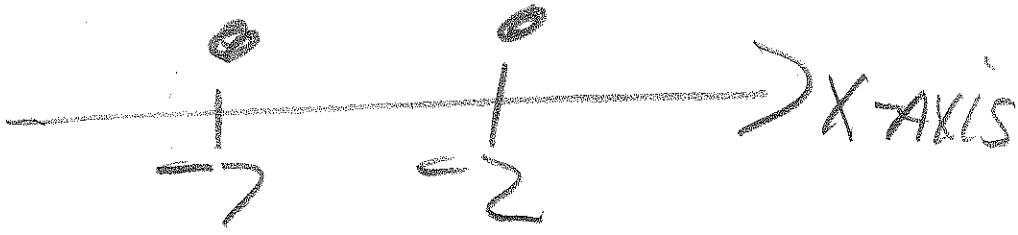
5.6

(8) $(x+2)(x+7)=0$

$x+2=0$ OR $x+7=0$

$-2\ -2$ $\quad\Longrightarrow\quad$ $-7\ -7$

$x=-2$ OR $x=-7$



(9) $x^2+7x+6=0$

factor

$(x+1)(x+6)=0$

$x+1=0$ OR $x+6=0$

$-1\ -1$ $\quad\Longrightarrow\quad$ $-6\ -6$

$x=-1$ OR $x=-6$

(10) $x^2+5x=0$

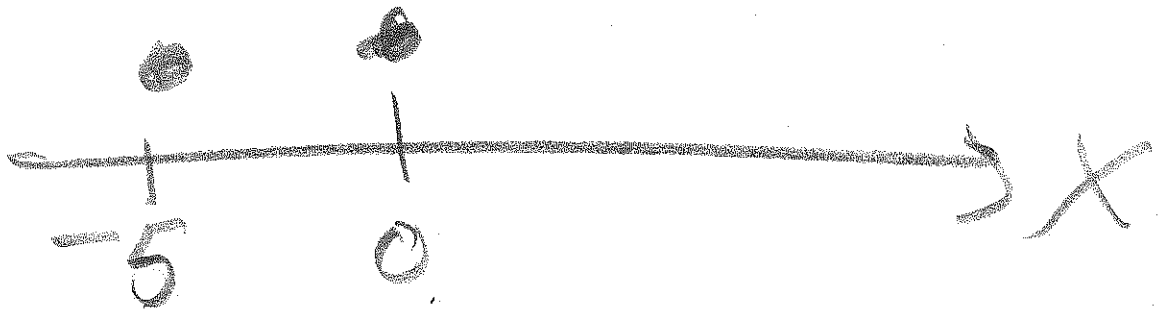
factor

$x\cdot(x+5)=0$

$x=0$ or $x+5=0$

$-5 \quad -5$

$x=0$ or $x=-5$



(11) x is $= x^2$ → (Translate)

solve (12) $0 = x^2 - x$ → (PRIME)

Better problem: $x = x^2 - 6$

(Contest 4) A number is 6 less than its square.

Better problem: Better than 11, 12.

$$0 = x^2 - x - 6$$

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

$$x+2=0 \text{ or } x-3=0$$

$$x=-2 \text{ or } x=3$$

6.1 (13) $\dfrac{x^2-4}{x^2+6x+8} = \dfrac{(x+2)(x-2)}{(x+2)(x+4)}$

$= \dfrac{(x-2)}{(x+4)}$

x^2-4

$= x^2-2^2$

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

x^2+6x+8

$= (x+2)(x+4)$

(14.) $\dfrac{9a^{60}}{6a^{20}} = \dfrac{3}{2} \cdot a^{60-20}$

$= \dfrac{3a^{40}}{2}$

3 ✗ 2

Quiz 11

sec 6.1

(15.) $\dfrac{x^2-11x+28}{x^2-10x+21}$

$= \dfrac{(x-7)\cdot(x-4)}{(x-7)\cdot(x-3)}$

$= \dfrac{(x-4)}{(x-3)}$