

Name: KEY

Read all directions and problems carefully! Show all appropriate work for credit

1. Solve the following using the Zero Product Property. (5 pts.)

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

$3x=0$
 $3=3$
 $x=0$

$5x-4=0$
 $+4 +4$
 $5x=4$
 $5=5$
 $x=\frac{4}{5}$
(+2)

$(a+4)(a-1)(a-5)=0$

$a+4=0; a-1=0; a-5=0$
 $a=-4; a=1; a=5$
(+3)

2. Solve the following quadratic equations. (9 pts.)

$3x^2 - 48 = 0$

$3(x^2-16)=0$
 $3(x-4)(x+4)=0$
 $x-4=0$
 $x+4=0$
 $x=4; x=-4$
(+2)

$a^2 - 3a = 10$

$a^2 - 3a - 10 = 0$
 $(a-5)(a+2) = 0$
 $a-5=0; a+2=0$
 $a=5; a=-2$
(+3)

$2b(b-2) = 6$

$2b^2 - 4b - 6 = 0$
 $2(b^2 - 2b - 3) = 0$
 $2(b-3)(b+1) = 0$
 $b-3=0; b+1=0$
 $b=3; b=-1$
(+4)

SET UP AND SOLVE the quadratic equation for the word problem.

3. Find two consecutive even integers such that the sum of their squares is 20. (8 pts.)

LET $x =$ FIRST CONSECUTIVE EVEN INTEGER

$x+2 =$ NEXT " "

(Sum) (is)
 $x^2 + (x+2)^2 = 20$

$x^2 + (x+2)(x+2) = 20$

$x^2 + x^2 + 4x + 4 = 20$

$2x^2 + 4x + 4 - 20 = 0$

$\rightarrow 2x^2 + 4x - 16 = 0$

$2(x^2 + 2x - 8) = 0$

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

$x = -4$
 $x+2 = -2$
(+8)

$x = 2$
 $x+2 = 4$

SET UP the quadratic equation for the word problem, but DO NOT SOLVE!

4. The length of a rectangular flower bed is 5 feet less than twice the width. Find the dimensions of the flower bed if the area is 88 square feet. (8 pts.)

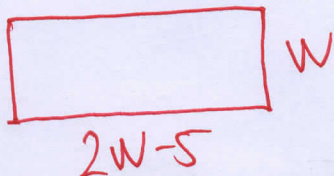
LET $W = \text{WIDTH}$

$2W - 5 = \text{LENGTH}$

AREA = LENGTH X WIDTH

$$88 = (2W - 5)W$$

+5



Reduce the following fractions/rational expressions as much as possible. (16 pts.)

$$\frac{78}{234} = \frac{2 \cdot 3 \cdot 13}{2 \cdot 3 \cdot 3 \cdot 13}$$

$$\frac{1}{3}$$

+2

$$\frac{x^5 y^6 z^2}{x^4 y^8 z^6}$$

$$\frac{x^1}{z^4}$$

+3

$$\frac{8 - 64a^3 b^3}{3 - 24a^3 b^3}$$

$$\frac{8}{3a^3 b^3}$$

+5

5. Reduce the rational expression to lowest terms. (15 pts.)

$$\frac{4a+12}{8a^2-72}$$

$$\frac{4(a+3)}{8(a^2-9)}$$

$$\frac{4(a+3)}{2 \cdot 4(a+3)(a-3)}$$

$$\frac{1}{2(a-3)}$$

+7

$$\frac{25-m^2}{2m^2-2m-60}$$

$$\frac{-1(m^2-25)}{2(m^2-m-30)}$$

$$\frac{-1(m-5)(m+5)}{2(m-6)(m+5)}$$

$$\frac{-1(m-5)}{2(m-6)}$$

+8

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7. Multiply the following fractions/rational expressions as much as possible. (9 pts.)

$$\left(-2\frac{5}{8}\right)\left(-\frac{6}{7}\right)\left(-3\frac{2}{3}\right)$$

$$\left(-\frac{\cancel{2}^3}{\cancel{8}_2}\right)\left(-\frac{\cancel{6}^2}{\cancel{7}_1}\right)\left(-\frac{\cancel{11}^3}{\cancel{3}_1}\right)$$

$$\frac{\cancel{33}^3}{\cancel{66}^6} = \frac{1}{\cancel{4}_4} \text{ or } \boxed{-\frac{33}{4}}$$

+4

$$\frac{\cancel{15}^3 x^4 y^3 \cdot \cancel{30}^6 a^4 b^2}{\cancel{25}^5 a^2 b^6 \cdot \cancel{42}^7 x^2 y^5}$$

$$\frac{\cancel{3}^3 a^2 x^2}{\cancel{7}^7 b^4 y^2}$$

+5

8. Multiply the following rational expressions, and reduce as much as possible. (16 pts.)

$$\frac{10n+15}{24n^3} \cdot \frac{36n^5}{8n+12}$$

$$\frac{5(\cancel{2n+3})}{4(\cancel{2n+3})} \cdot \frac{\cancel{36}^3 n^5}{\cancel{24}^2 n^3}$$

$$\boxed{\frac{15n^2}{8}}$$

+6

$$\frac{y^2-16}{2y-8} \cdot \frac{-8}{3y^2+10y-8}$$

$$\frac{(\cancel{y-4})(\cancel{y+4})}{\cancel{2}(y-4)} \cdot \frac{\cancel{-8}^{-4}}{(\cancel{y+4})(3y-2)}$$

$$\boxed{\frac{-4}{3y-2}}$$

+10

$$\frac{-24 \cdot 10}{+12(-2)}$$

$$\begin{aligned} & 3y^2 + 12y - 2y - 8 \\ & 3y(y+4) - 2(y+4) \\ & (y+4)(3y-2) \end{aligned}$$

8. Divide the following fractions/rational expressions, and reduce as much as possible.

(20 pts.)

$$\left(-3\frac{1}{3}\right) \div \left(-2\frac{1}{7}\right)$$

$$-\frac{10}{3} \div \left(-\frac{15}{7}\right)$$

$$\left(-\frac{10}{3}\right) \cdot \left(\frac{-7}{15}\right)$$

$$\boxed{\frac{14}{9}} \text{ or } \boxed{1\frac{5}{9}} \quad (+4)$$

$$\frac{ab+3a+2b+6}{b^2+6b+9} \div \frac{2a^2+a-6}{2a-3}$$

$$\frac{a(b+3)+2(b+3)}{(b+3)(b+3)} \cdot \frac{(2a-3)}{2a^2+a-6}$$

$$\frac{(b+3)(a+2)}{(b+3)(b+3)} \cdot \frac{(2a-3)}{(2a-3)(a+2)}$$

$$\Rightarrow = \boxed{\frac{1}{b+3}} \quad (+8)$$

$$\frac{3y-y^2}{2y^2-50} \div \frac{y^2-9}{2y^2+16y+30}$$

$$\frac{-y(y-3)}{2(y^2-25)} \cdot \frac{2(y^2+8y+15)}{y^2-9}$$

$$\frac{-y(y-3)}{2(y-5)(y+5)} \cdot \frac{2(y+3)(y+5)}{(y-3)(y+3)}$$

$$\boxed{\frac{-y}{y-5}} \quad (+8)$$

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