

- ➔ **YOU MUST SHOW LOGICAL AND ORGANIZED ALGEBRAIC WORK TO EARN FULL CREDIT**  
➔ **PUT A BOX AROUND YOUR FINAL ANSWER**

Fill in the blanks: The equation of the horizontal asymptote for  $y = \frac{3-6x}{13x+7}$  is  $y = -\frac{6}{13}$ . SCORE: \_\_\_ / 6 POINTS

$$y \approx \frac{-6x}{13x} = -\frac{6}{13}$$

The equation of the vertical asymptote for  $y = \frac{3-6x}{13x+7}$  is  $x = -\frac{7}{13}$ .

$$13x+7=0$$

$$x = -\frac{7}{13}$$

Solve: The weight of a drum of hazardous waste varies jointly as its height and the area of its lid. SCORE: \_\_\_ / 12 POINTS  
If a 150 pound drum of hazardous waste is 3 feet tall with a lid of 4 square feet, find the height of a 120 lb drum of hazardous waste with a lid of 5 square feet.

**FOR FULL CREDIT, YOU MUST FOLLOW THE COMPLETE PROCEDURE SHOWN IN CLASS.**  
**SUMMARIZE YOUR ANSWER IN A SENTENCE, INCLUDING UNITS.**

W = WEIGHT OF DRUM (lb)

h = HEIGHT " (ft)

a = AREA OF LID (ft<sup>2</sup>)

$$W = kha$$

$$150 = k(3)(4)$$

$$k = 12.5$$

$$W = 12.5ha$$

$$120 = 12.5h(5)$$

$$120 = 62.5h$$

$$h = 1.92$$

A 120 lb DRUM WITH  
A 5 SQUARE FOOT  
LID IS 1.92 FEET  
TALL

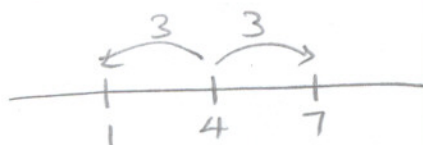
Solve for x:  $10 - |4 - x| = 7$

**CHECK YOUR ANSWER(S)**

SCORE: \_\_\_ / 10 POINTS

$$-|4 - x| = -3$$

$$|4 - x| = 3$$



$$x = 1, 7$$

CHECK:

$$x = 1$$

$$10 - |4 - 1|$$

$$= 10 - |3|$$

$$= 10 - 3$$

$$= 7 \checkmark$$

$$x = 7$$

$$10 - |4 - 7|$$

$$= 10 - | -3 |$$

$$= 10 - 3$$

$$= 7 \checkmark$$

Simplify:

$$\begin{aligned} \frac{\frac{7}{x-2} + 3}{\frac{4}{x-2} - 5} \cdot \frac{(x-2)}{(x-2)} &= \frac{7 + 3(x-2)}{4 - 5(x-2)} \\ &= \frac{7 + 3x - 6}{4 - 5x + 10} \\ &= \boxed{\frac{3x + 1}{14 - 5x}} \end{aligned}$$

SCORE: \_\_\_ / 10 POINTS

Add and simplify:

$$\begin{aligned} \frac{3x^2 + 2x - 5}{x^2 - 5x - 6} + \frac{3 - 3x - 2x^2}{x^2 - 5x - 6} \\ &= \frac{x^2 - x - 2}{x^2 - 5x - 6} \\ &= \frac{(x+1)(x-2)}{(x+1)(x-6)} = \boxed{\frac{x-2}{x-6}} \end{aligned}$$

SCORE: \_\_\_ / 8 POINTS

Simplify:

$$\begin{aligned} \frac{\frac{5}{x-3} - \frac{2}{x}}{\frac{3}{x} + \frac{4}{x-3}} \cdot \frac{x(x-3)}{x(x-3)} &= \frac{5x - 2(x-3)}{3(x-3) + 4x} \\ &= \frac{5x - 2x + 6}{3x - 9 + 4x} \\ &= \frac{3x + 6}{7x - 9} = \boxed{\frac{3(x+2)}{7x-9}} \end{aligned}$$

SCORE: \_\_\_ / 10 POINTS

Solve for x:

$$\frac{2}{x+1} - \frac{1}{x^2+x} = \frac{1}{x}$$

CHECK YOUR ANSWER(S)

SCORE: \_\_\_ / 12 POINTS

$$\text{LCD} = x(x+1)$$

$$x(x+1) \left( \frac{2}{x+1} - \frac{1}{x(x+1)} \right) = x(x+1) \left( \frac{1}{x} \right)$$

$$2x - 1 = x + 1$$

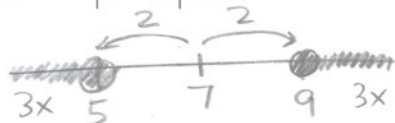
$$\boxed{x = 2}$$

$$\begin{aligned} \text{CHECK: } \frac{2}{3} - \frac{1}{6} \\ &= \frac{4}{6} - \frac{1}{6} \\ &= \frac{3}{6} \\ &= \frac{1}{2} \checkmark \end{aligned}$$

Solve for x:

$$|7 - 3x| \geq 2$$

SCORE: \_\_\_ / 10 POINTS



$$3x \leq 5 \text{ OR } 3x \geq 9$$

$$x \leq \frac{5}{3} \text{ OR } x \geq 3$$

OR

$$7 - 3x \geq 2 \text{ OR } 7 - 3x \leq -2$$

$$-3x \geq -5 \text{ OR } -3x \leq -9$$

$$x \leq \frac{5}{3} \text{ OR } x \geq 3$$

Solve:

Twelve divided by a number equals the number plus five divided by three.  
Find all possible values for the number. CHECK YOUR ANSWER(S).

SCORE: \_\_\_ / 10 POINTS

$$\frac{12}{x} = \frac{x+5}{3}$$

$$36 = x^2 + 5x$$

$$0 = x^2 + 5x - 36$$

$$0 = (x+9)(x-4)$$

$$x = -9, 4$$

CHECK:

$$x = -9$$

$$\frac{12}{-9} = \frac{-4}{3}$$

$$= -\frac{4}{3} = -\frac{4}{3}$$

✓

$$x = 4$$

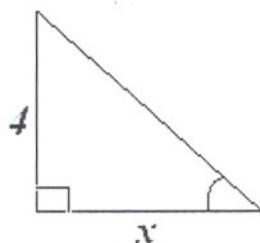
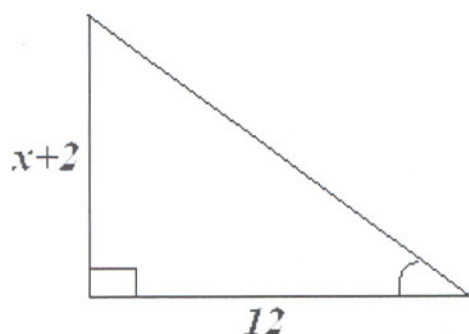
$$\frac{12}{4} = \frac{9}{3}$$

$$= 3 = 3$$

✓

Solve for x:

SCORE: \_\_\_ / 10 POINTS



$$\frac{x+2}{12} = \frac{4}{x}$$

$$x^2 + 2x = 48$$

$$x^2 + 2x - 48 = 0$$

$$(x+8)(x-6) = 0$$

$$x = -8 \text{ OR } x = 6$$

Divide and simplify:

$$\frac{8x^2 + 12x}{x^3 - 5x^2 + 6x} \div \frac{4x^2 - 9}{x^2 + 3x - 18}$$

SCORE: \_\_\_ / 10 POINTS

$$= \frac{4 \times (2x+3)}{x(x^2-5x+6)} \cdot \frac{x^2+3x-18}{4x^2-9}$$

$$= \frac{4 \cancel{x} (2x+3)}{x \cancel{(x-2)} \cancel{(x-3)}} \cdot \frac{(x+6) \cancel{(x-3)}}{\cancel{(2x+3)} (2x-3)} = \boxed{\frac{4(x+6)}{(x-2)(2x-3)}}$$

Simplify:

$$\frac{6x^2 - 5x - 4}{4x^2 - 4x - 3}$$

SCORE: \_\_\_ / 10 POINTS

$$= \frac{(2x+1)(3x-4)}{(2x+1)(2x-3)}$$

$$= \boxed{\frac{3x-4}{2x-3}}$$

Subtract and simplify:

$$\frac{x+5}{x+3} - \frac{x-4}{x-2}$$

SCORE: \_\_\_ / 10 POINTS

$$= \frac{x+5}{x+3} \cdot \frac{x-2}{x-2} - \frac{x-4}{x-2} \cdot \frac{x+3}{x+3}$$

$$= \frac{x^2+3x-10 - (x^2-x-12)}{(x+3)(x-2)} = \frac{4x+2}{(x+3)(x-2)} = \boxed{\frac{2(2x+1)}{(x+3)(x-2)}}$$

Subtract and simplify:

$$\frac{x+2}{x^2+x-12} - \frac{x-1}{x^2-6x+9}$$

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

$$x^2-6x+9 = (x-3)^2$$

SCORE: \_\_\_ / 12 POINTS

$$LCD = (x+4)(x-3)^2$$

$$= \frac{x+2}{(x+4)(x-3)} \cdot \frac{x-3}{x-3} - \frac{x-1}{(x-3)^2} \cdot \frac{x+4}{x+4}$$

$$= \frac{x^2-x-6 - (x^2+3x-4)}{(x+4)(x-3)^2}$$

$$= \frac{-4x-2}{(x+4)(x-3)^2} = \boxed{\frac{-2(2x+1)}{(x+4)(x-3)^2}}$$