1) Subtract the polynomials. Write answer as a polynomial in descending order of powers.

$(5x^3-3x^2+2)-(6.5x^2-5x+9.6x^3-8)$

$=5x^3-3x^2+2-6.5x^2+5x-9.6x^3+8$

$=-4.6x^3-9.5x^2+5x+10$

2) Circle the letter in front of the choice that is **false** concerning the polynomial below.

$7x^5-4x^3+9x+2-8x^6+2x^4$

B

A The polynomial has 6 terms.

B The leading coefficient is 7.

C The 2 is called the 'constant' term.

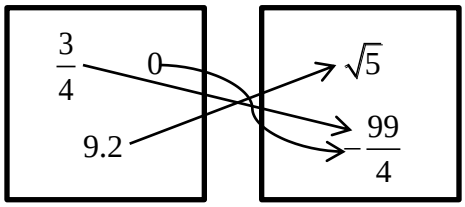
D In standard form, the polynomial would be written $-8x^6+7x^5+2x^4-4x^3+9x+2$.

E The degree of the polynomial is 6.

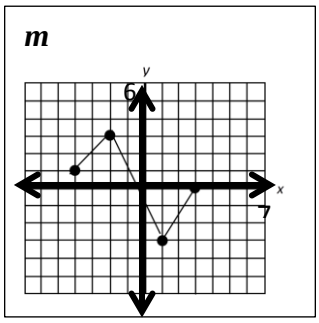
3) Examine the 4 relations (***f, g, m* and *h*)** below and read the choices following. Circle the letter in front of the **true** statement.

f : $\{(2,-3),(\pi,-\frac{4}{3}),(6.3,0),(\sqrt{5},-3)\}$

g



m



h

x	2	1.4	0	$\sqrt{11}$	-2	$\frac{5}{4}$
$h(x)$	-4	0	$\frac{4}{5}$	1001	0.23	-4

A

A The domain of relation *m* is $[-4,3]$.

B The range of function *h* is $\{-2,0,1.4,\frac{5}{4},\sqrt{11}\}$.

C All represent functions, except *h*.

D $g(\sqrt{5})=9.2$

E $f(2)\neq f(\sqrt{5})$

4) If $f(x)=5x^2-2x$, find and simplify $f(r+3)$ as a polynomial in descending order of terms.

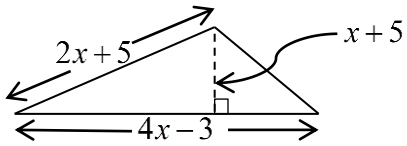
$$\begin{aligned} f(r+3) &= 5(r+3)^2-2(r+3) \\ &= 5(r^2+6r+9)-2(r+3) \\ &= 5r^2+30r+45-2r-6 \\ &= 5r^2+28r+39 \end{aligned}$$

5) Find the product: $(x^2-4x+3)^2$ Write terms of polynomial in descending order.

$$\begin{aligned} &= (x^2-4x+3)(x^2-4x+3) \\ &= x^2(x^2-4x+3)-4x(x^2-4x+3)+3(x^2-4x+3) \\ &= x^4-4x^3+3x^2 \;\; -4x^3+16x^2-12x \;\; +3x^2-12x+9 \\ &= x^4-8x^3+22x^2-24x+9 \end{aligned}$$

6) Represent the area of the triangle below with a polynomial. Hint: $A=\frac{1}{2}bh$

Write answer as a polynomial.



$$\begin{aligned} A &= \frac{1}{2}(4x-3)(x+5) \\ A &= \frac{1}{2}(4x^2+20x-3x-15) \\ A &= \frac{1}{2}(4x^2+17x-15) \\ A &= 2x^2+\frac{17}{2}x-\frac{15}{2} \end{aligned}$$

7) Solve this equation. Write answer as x = solution.

$$\frac{3x}{5} - x = \frac{x}{10} - \frac{5}{2} \qquad LCD = 10$$

$$10\left(\frac{3x}{5} - x\right) = 10\left(\frac{x}{10} - \frac{5}{2}\right)$$
$$6x - 10x = x - 25$$
$$-4x = x - 25$$
$$-5x = -25$$
$$x = 5$$

8) Solve this rational equation. Identify this equation as conditional, an identity, or a contradiction by circling the correct word below.

$$\frac{3}{x+6} + \frac{1}{x-2} = \frac{4}{x^2+4x-12}$$

$$\frac{3}{x+6} + \frac{1}{x-2} = \frac{4}{(x+6)(x-2)} \qquad LCD = (x+6)(x-2) \rightarrow x \neq 2 \text{ or } -6$$

$$(x+6)(x-2)\left(\frac{3}{x+6} + \frac{1}{x-2}\right) = (x+6)(x-2)\left(\frac{4}{(x+6)(x-2)}\right)$$

$$(x+6)(x-2)\left(\frac{3}{x+6}\right) + (x+6)(x-2)\left(\frac{1}{x-2}\right) = (x+6)(x-2)\left(\frac{4}{(x+6)(x-2)}\right)$$

$$3(x-2) + 1(x+6) = 4$$
$$3x - 6 + x + 6 = 4$$
$$4x = 4$$
$$x = 1$$

CONDITIONAL IDENTITY CONTRADICTION

9) Lois and Clark are traveling in opposite directions (on a straight highway) from the same location. Lois leaves at 8:00 AM and averages 35 miles per hour. Clark leaves ¼ hour later and travels an average rate of 40 miles per hour. At what time (clock time, for example 1:00 PM) will they be 215 miles apart? A chart has been provided, if it helps.

	Distance	Rate	Time
LOIS	$35x$	35	x
CLARK	$40(x-\frac{1}{4})$	40	$x-\frac{1}{4}$

Lois' distance + Clark's distance totals 215 miles

$35x+40(x-\frac{1}{4})=215$

$35x+40x-10=215$

$75x=225$

$x=3$ hours time for Lois

8:00 AM + 3 hours = 11:00 AM

10) Solve this quadratic equation: $5x^2=6-13x$

Separate solutions in the set with commas if there is more than one solution.

$5x^2+13x-6=0$ Product = $ac=-30$ Sum = $b=13$

Pair that has a product of ac and a sum of b is 15 and -2.

$5x^2+15x-2x-6=0$

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

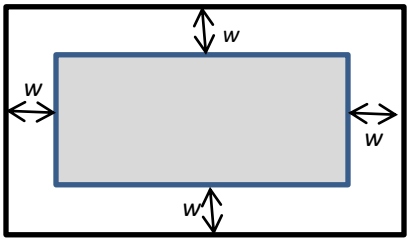
$(x+3)(5x-2)=0$

$x+3=0$ $5x-2=0$

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

11) A pool measuring 20 meters by 10 meters is surrounded by a path of uniform width, as shown. If the area of the pool **plus** the path combined is 600 square meters, what is the *width* of the path?

Write an equation with variable w to represent the problem and solve.



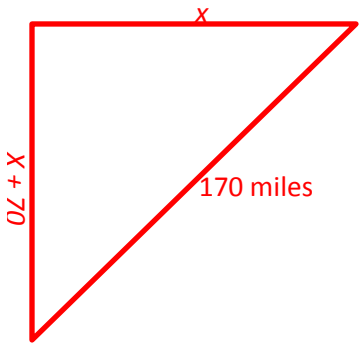
Outside length $= 20 + 2w$

Outside width $= 10 + 2w$

$$A = Lw$$
$$600 = (20+2w)(10+2w)$$
$$600 = 200 + 40w + 20w + 4w^2$$
$$0 = 4w^2 + 60w - 400$$
$$0 = 4(w^2 + 15w - 100)$$
$$0 = w^2 + 15w - 100$$
$$0 = (w+20)(w-5)$$
$$w + 20 = 0 \quad \text{or} \quad w - 5 = 0$$
$$w = -20 \qquad w = 5$$

Width is 5 m (the only reasonable answer).

12) Two cars leave a parking lot at the same time, one heading due south and the other heading due east. After a time, the cars are 170 miles apart. If the car going south traveled 70 miles farther than the other car, how many miles did they **each** travel? (Use an equation.) You might want to draw a picture.



$a^2 + b^2 = c^2$ (Pythagorean theorem)

$$x^2 + (x+70)^2 = 170^2$$
$$x^2 + x^2 + 140x + 4900 = 28900$$
$$2x^2 + 140x = 24000$$
$$2x^2 + 140x - 24000 = 0$$
$$2(x^2 + 70x - 12000) = 0$$
$$x^2 + 70x - 12000 = 0$$
$$x = \frac{-70 \pm \sqrt{70^2 - 4(1)(-12000)}}{2(1)} = \frac{-70 \pm \sqrt{4900 + 48000}}{2}$$
$$= \frac{-70 \pm \sqrt{52900}}{2} = \frac{-70 \pm 230}{2} \qquad x = \frac{160}{2} = 80 \text{ or } x = -\frac{300}{2} = -150$$

Since x cannot be negative, the only reasonable value for x is 80.

East bound car: 80 miles

South bound car: 150 miles