

For problem 1, find an exponential model that fits the data using any method. Then use your equation to find y when $x = 3$.

1a. (0,3) and (1, 18.6)

1b. (2, .04) and (-1, .625)

$$y = 3(6.2)^x$$

$x = 3, y = 714.984$

$$y = .25(.4)^x$$

$x = 3, y = .016$

2. The housing market has been in an exponential fluctuation lately. The prices of condominiums have been going up because there are many elderly people looking for the easier life. However, the price of houses has been decreasing for some time now. A new condominium in Dusty Depot cost \$150,000 but the prices of have been increasing by 3% each year. Where houses in Snobby Shores cost \$400,000 4 years ago and this year is valued at \$345,000. Write an equation for each situation and find out which one would be worth more if I plan to sell it in 12 years.

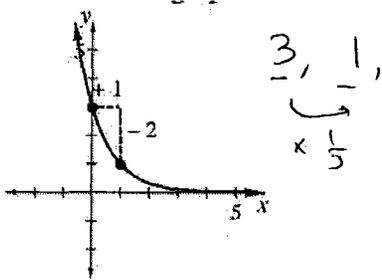
C: $y = 150,000(1.03)^x$

H: $(-4, 400,000) \rightarrow (0, 345,000) \rightarrow y = 345,000(.964)^x$

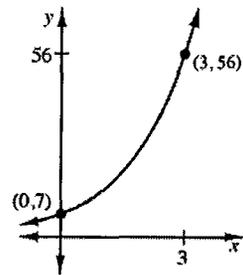
C: \$213,864

H: \$222,199

3. Write an exponential equation for each graph.



$$y = 3\left(\frac{1}{3}\right)^x$$



$$y = 7(2)^x$$

4. Solve each equation for x .

a) $3x + 7 = 5(x + 2) + x - 1$

$$3x + 7 = 5x + 10 + x - 1$$

$$3x + 7 = 6x + 9$$

$$-2 = 3x$$

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

b) $\frac{4x}{5} - 5 = x - \frac{x}{6}$

$$\frac{20x}{5} - 25 = 5x - \frac{5x}{6}$$

$$4x - 25 = 5x - \frac{5x}{6}$$

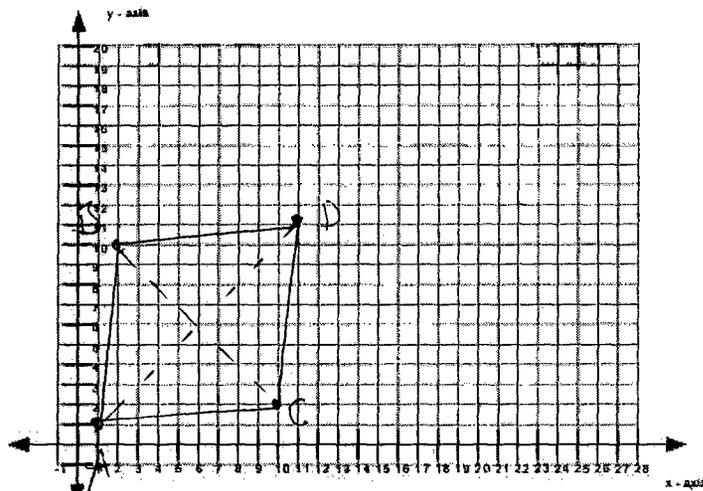
$$24x - 150 = 30x - \frac{30x}{6}$$

$$24x - 150 = 30x - 5x$$

$$\boxed{-150 = x}$$

5. A quadrilateral has vertices at points $A(1,1)$, $B(2,10)$, $C(10,2)$ and $D(11,11)$.

a) Graph quadrilateral $ABCD$, along with its diagonals, \overline{AC} and \overline{BD} . Label all points.



b) Quadrilateral $ABCD$ seems to be a square. Squares have the properties that all 4 sides are equal. Show if quadrilateral $ABCD$ has this property.

$$\overline{AB} = \sqrt{(1-2)^2 + (1-10)^2} = \sqrt{82}$$

$$\overline{BD} = \sqrt{(2-11)^2 + (10-11)^2} = \sqrt{82}$$

$$\overline{DC} = \sqrt{(10-11)^2 + (2-11)^2} = \sqrt{82}$$

$$\overline{CA} = \sqrt{(1-10)^2 + (1-2)^2} = \sqrt{82}$$

All 4 sides same.

c) What appears to be true about the diagonals on Quadrilateral $ABCD$? Algebraically show that this is true here.

perpendicular?

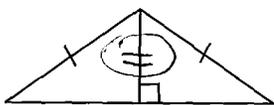
Slope of BC is $\frac{-8}{8} = -1$

Slope of AD is $\frac{10}{10} = 1$

opp reciprocals
so yes they
are perpendicular!

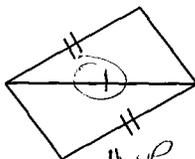
6. For each pair of triangles, state which Triangle Congruence Condition you would use to show the triangles are congruent. If there is not enough information to show them congruent, write **N.P.** for not possible.

a)



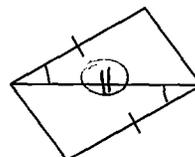
HL

b)



NP

c)



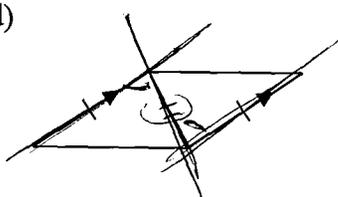
SAS

a) HL

b) NP

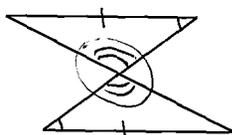
c) SAS

d)



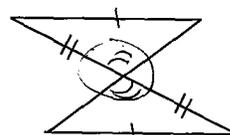
SAS

e)



AAS

f)



~~AAS~~

d) SAS

e) AAS

f) NP

7. The gamers who play Fortnite are made up of Adults (older than 18) and Children (younger than 18). If the number of gamers in a match is 100 people, and I know that the number of Adults is 14 less than twice the number of Children, write and solve an equation to find the number of each type of gamer.

$$A + C = 100$$

$$A = 2C - 14$$

$$2C - 14 + C = 100$$

$$3C = 114$$

$$C = 38$$

$$A = 62$$

8. The expression $\frac{(2x)^3(5x^4y^3)^3}{40x^{-2}y^9(3xy)^0}$ simplifies into what?

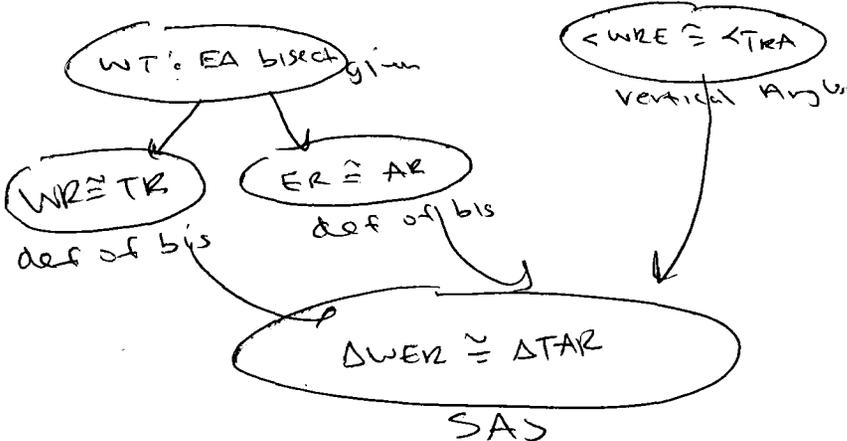
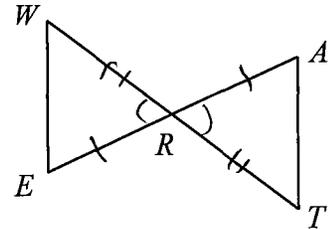
$$\frac{(8x^3)(125x^{12}y^9)}{40x^{-2}y^9}$$

$$\frac{1000x^{15}y^9}{40x^{-2}y^9}$$

$$25x^{17}$$

9. Use a flowchart to show that $\triangle WER \cong \triangle TAR$. (You should have 5 steps.)
(If you "bisect" an object, you divide that object into 2 equal parts.)

Given Information: \overline{WT} and \overline{EA} bisect each other.



10. Solve each problem below. If it is an inequality, draw and shade an appropriate number line.

a. $|2x + 3| = 18$

$$2x + 3 = 18$$

$$2x + 3 = -18$$

$$2x = 15$$

$$2x = -21$$

$$x = 7.5$$

$$x = -10.5$$

b. $4x + 3 > 7$ or $3(x + 2) \leq 6$

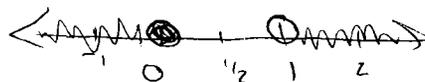
$$4x > 4$$

$$3x + 6 \leq 6$$

$$x > 1$$

$$3x = 0$$

$$x = 0$$



c. $|2(x - 1)| \geq 8$

$$|2(x - 1)| = 8$$

$$2(x - 1) = 8$$

$$2(x - 1) = -8$$

$$2x - 2 = 8$$

$$2x - 2 = -8$$

$$x = 5$$

$$x = -3$$



