Each Problem = 2pts

Review!

*You will turn this in the Tuesday you get back.

I will pick 10 random problems to grade. ALL work must be shown for you to get full credit.

1. Solve for z: $\frac{2z+4}{6} = 2y$ ·6

$2z+4=12y$

$-4 \quad -4$

$\frac{2z}{2} = \frac{12y}{2} - \frac{4}{2}$

$z = 6y-2$

2. Solve the equation: $\frac{1}{3}y + \frac{1}{4} = \frac{1}{3}y + \frac{5}{12}$

$-\frac{1}{3}y \quad -\frac{1}{3}y$

$\frac{1}{4} = \frac{5}{12}$

No solution

3. Solve the inequality AND graph the solution on a number line. $6x + 2(x+2) > 2 + 3(x+3)$

$6x-2x-4 > 2-3x-9$

$4x-4 > -3x-7$

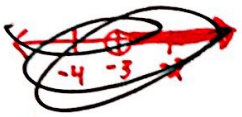
$+3x \quad +3x$

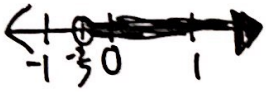
$7x-4 > -7$

$+4 \quad +4$

$\frac{7x}{7} > \frac{-3}{7}$

$x > -\frac{3}{7}$





4. Solve the equation: $\frac{-4(2x-8)}{6} = 2x - 8 - 4x$

$-8x+32 \quad -2x-8$

$\frac{-8x+32}{6} = (-2x-8)\cdot 6$

$-8x+32 = -12x-48$

$+12x \quad -32 \quad +12x \quad -32$

$4x = -80$

$x = -20$

5. Nate has a goal of riding his bike at least 150 miles this spring. He has ridden 25 miles so far. There are 30 days left in spring.

a) Write an inequality to represent the average distance **d** Nate must ride each day to achieve his goal.

$25 + 30d \geq 150$ or $30d \geq 125$

b) Solve the inequality you wrote in (a) AND graph the solution on a number line.

$\frac{30d}{30} \geq \frac{125}{30}$

$d \geq \frac{125}{30} \rightarrow d \geq 4\frac{1}{6}$

$\frac{125}{30} = \frac{25}{6} = 4\frac{1}{6}$

6. Maggie's brother is 3 years younger than twice her age. The sum of their ages is 24. How old is Maggie?

M = Maggie's age

Brother = $2M-3$

$M + (2M-3) = 24$

$+3 \quad +3$

$\frac{3M}{3} = \frac{27}{3}$ $M = 9$

9 years old

2.9-3

Brother = 15

$15+9=24$ ✓

7. Kurt works at a cafe and earns $16 per hour. On Wednesday, he worked *t* hours at the cafe, and his neighbor paid him $5 per hour to babysit for *b* hours. Which expression best represents the amount Kurt earned on Wednesday?

A $16t + 5$

B $16t - 5b$

C $16t + 5b$

D $16b + 5t$

* 8. Which tree is growing fastest? Which is growing slowest? EXPLAIN your answer.

Tree A	
Day	Height (in)
0	32.5
4	32.7
8	32.9
12	33.1
16	33.3

Tree B	
Day	Height (in)
0	25.4
1	25.44
2	25.48
3	25.52
4	25.56

Tree C	
Day	Height (in)
0	15
10	15.8
20	16.6
30	17.4
40	18.2

Tree D	
Day	Height (in)
0	21.3
5	21.45
10	21.6
15	21.75
20	21.9

$\frac{0.2\text{ in}}{4\text{ days}} = 0.05\frac{\text{in}}{\text{day}}$ $\quad \frac{0.04\text{ in}}{1\text{ day}} = 0.04\frac{\text{in}}{\text{day}}$ $\quad \frac{0.8\text{ in}}{10\text{ days}} = 0.08\frac{\text{in}}{\text{day}}$ $\quad \frac{0.15\text{ in}}{5\text{ days}} = 0.03\frac{\text{in}}{\text{day}}$

Tree C grows fastest (0.08 in/day) and Tree D grows slowest (0.03 in/day)

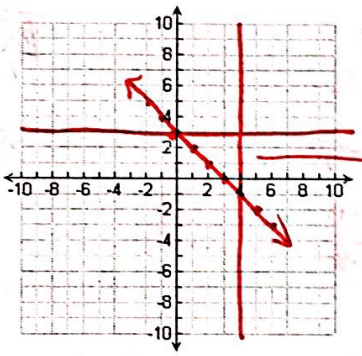
9. A pool that is being drained contained 18,000 gallons of water originally. After 2 hours, 12,500 gallons of water remain. Write an equation in slope-intercept form to model the situation.

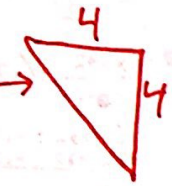
$y = mx + b$ $\quad -5500$ gallons in 2 hrs $\rightarrow$ 2750 gallons in 1 hr

$y = -2750x + 18{,}000$ $\quad x = \#\text{hrs}$, $y = \#\text{gal}$

10. The intersections of the graphs of the given inequalities form a triangle. What is the area of the triangle?

$$\begin{cases} y \le 3 \\ x \le 4 \\ y \ge -x + 3 \end{cases}$$





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

$A = 8\text{ units}^2$

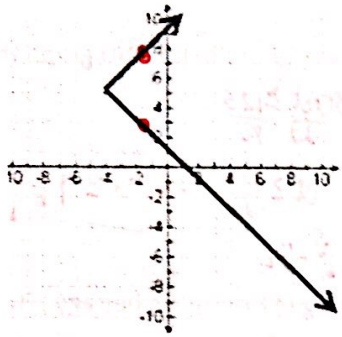
11. Is each of the following a function?

A (5, 4), (6, 7), (7, 8), (8, 9)
● Yes ○ No

B (5, 4), (5, 5), (5, 6), (5, 7)
○ Yes ● No

C (-3, 4), (-2, 7), (-1, 8), (0, 8)
● Yes ○ No

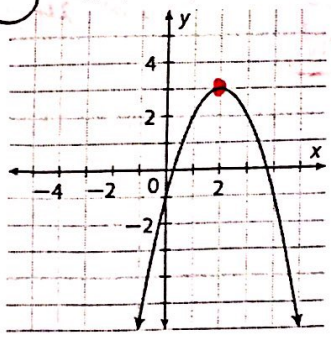
* 12. Is this the graph of a function? Why or Why not?



No

Several inputs (x) have multiple outputs (y)

* 13. The graph of $f(x)$ is below.



$g(x) = 4x^3 - 15x$ $\quad g(2) = 4(2^3) - 15(2) = 4 \cdot 8 - 30 = 32 - 30 = 2$

$h(x) = -3x - 1$ $\quad h(2) = -3(2) - 1 = -6 - 1 = -7$

$f(2) = 3$

Which function $f(x)$, $g(x)$, or $h(x)$, has the greatest value when $x = 2$?

f(x)

Simplify: $\frac{60a^{6}b^{3}a^{6}e^{2}}{12a^{6}e^{-2}}$

$\frac{15b^3a^6e^2\cdot e^2}{a^6}$ → $15b^3e^4$

* 15. Simplify: $-(6^2)\cdot 2^{-2}\cdot 9^{-1}$

$-36\cdot\frac{1}{4}\cdot\frac{1}{9}$

$\frac{-36}{1}\cdot\frac{1}{36}$

-1

16. Simplify $\left(\frac{2c^{-3}a^4}{a^{10}a^6}\right)^2\left(\frac{a^{10}a^6}{2c^{-3}a^4}\right)^2\left(\frac{2c^{-3}a^4}{a^{10}a^6}\right)^2\left(\frac{a^{10}}{2a^4}\right)^2$

$\left(\frac{2}{c^3a^6}\right)^2\left(\frac{a^6\cdot c^3}{2}\right)^2\left(\frac{2}{c^3a^6}\right)^2\left(\frac{a^6}{2}\right)^2$

$\frac{4}{c^6a^{12}}\cdot\frac{a^{12}c^6}{4}\cdot\frac{4}{c^6a^{12}}\cdot\frac{a^{12}}{4}=\frac{1}{c^6}$

* 17. The first term of a geometric sequence is -2 and the common ratio is 3. What is the 12th term of the sequence?

A -1,062,882 C -6144 $-2\cdot3^{11}$

B -354,294 D 12, 288

18. Write the explicit rule AND the recursive rule for the arithmetic sequence: 15, 26, 37, 48, ...

Explicit: $f_n = 15 + 11(n-1)$

Recursive: $f_1 = 15$; $f_n = f_{n-1} + 11$

19. The third term of a sequence is 300. Each term after that is 5 times the previous term. Write an explicit and recursive formula to model this situation.

$a_3 = 300$

$a_2 = 60$

$a_1 = 12$

EXPLICIT

$a_n = 12\cdot5^{n-1}$

RECURSIVE

$a_1 = 12$

$a_n = 5\cdot a_{n-1}$

20. Chess club earnings are $40 per month and will increase at a rate of 2.5% each month. Which function describes this situation?

102.5% → 1.025

A $y = 40(0.75)^x$ C $y = 40(1.025)^x$

B $y = 40(0.975)^x$ D $y = 40(1.25)^x$

21. A pond has 98 fish, and the population decreases by 5% each day. Find the population after 2 weeks.

$P_n = 98(0.95)^n$

$98\cdot(0.95)^{14}$

48 fish

* 22. The number of students at a university is 1320, and the number increases by 8% each year. Write an exponential function to model this situation. Then find about how many students there will be in 5 years.

Function: $f(x) = 1320(1.08)^x$

$1320(1.08)^5$

1940 students

23) Kyle deposits $500 into a savings account that earns 2.4% interest per year. He plans on keeping the money in his account for 10 years. He has the option of compounding the interest yearly, quarterly, or monthly.

Write a compound interest formula for each option (yearly, quarterly, and monthly).

Yearly: $f(t) = 500\left(1 + \frac{.024}{1}\right)^{1t} \rightarrow f(t) = 500(1.024)^t$

Quarterly: $g(t) = 500\left(1 + \frac{.024}{4}\right)^{4t} \rightarrow g(t) = 500(1.006)^{4t}$

Monthly: $h(t) = 500\left(1 + \frac{.024}{12}\right)^{12t} \rightarrow h(t) = 500(1.002)^{12t}$

How much **more** money would Kyle make in 10 years with the best option as compared to the worst option?

Yearly: $500(1.024)^{10} \approx \$633.83$

Quarterly: $500(1.006)^{40} \approx \$635.17$

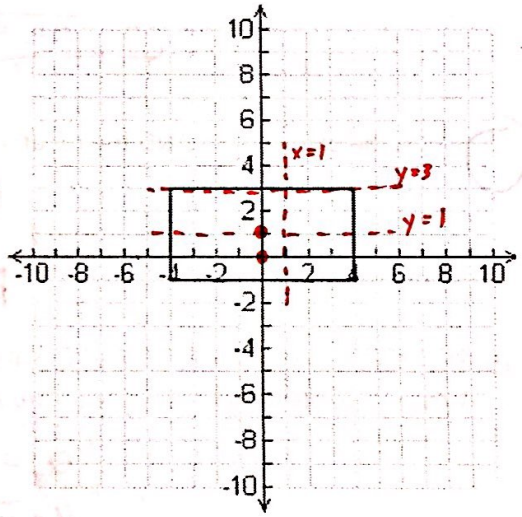
Monthly: $500(1.002)^{120} \approx \$635.47$

635.47
−633.83
1.64

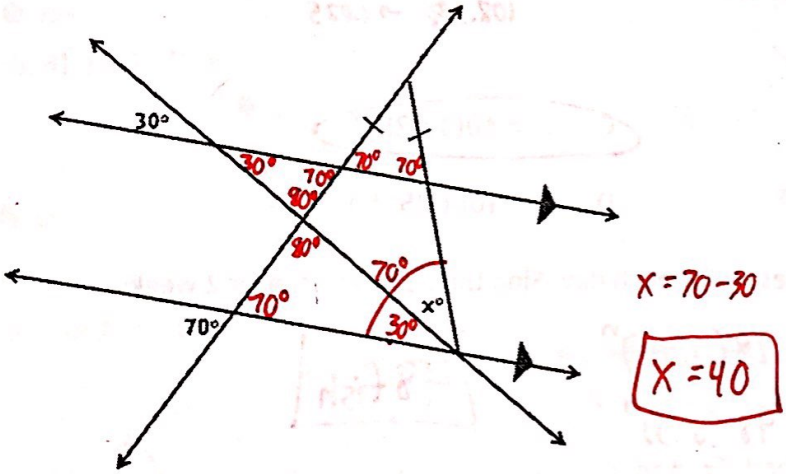
$1.64

24. Which transformations would map the rectangle onto itself? **Select all that apply.**

A. Reflection across the x-axis
B. Reflection across the y-axis
C. Reflection across the line x = 1
D. Reflection across the line y = 1
E. 180° rotation around the origin
F. 180° rotation around (0, 1)
G. 360° rotation around the origin
H. Translation 4 units up, then a reflection across the line y = 3
I. Translation 1 unit down, then a reflection across the x-axis
J. 180° rotation around the origin, then a translation of 2 units up.



25. Find the value of x.



$x = 70 - 30$

$x = 40$