Answers

Full Year Practice Test 1

Part I (2 points each)

$d = rt$ or $\frac{min}{mi}$ $\frac{15}{5} = \frac{x}{8}$

1) *It takes Tammy 45 minutes to ride her bike 5 miles. At this rate, how long will it take her to ride 8 miles?*

(1) 0.89 hour (2) 1.125 hours (3) 48 minutes (4) 72 minutes

2) *What are the roots of the equation $x^2 - 7x + 6 = 0$?*

$(x-6)(x-1) = 0$

(1) 1 and 7 (2) −1 and 7 (3) −1 and −6 (4) 1 and 6

3) *Which expression represents $\frac{27x^{18}y^5}{9x^6y}$ in simplest form?* $3x^{18-6}y^{5-1}$

(1) $3x^{12}y^4$ (2) $3x^3y^5$ (3) $18x^{12}y^4$ (4) $18x^3y^5$

4) *Marie currently has a collection of 58 stamps. If she buys s stamps each week for w weeks, which expression represents the total number of stamps she will have?*

(1) $58sw$ (2) $58 + sw$ (3) $58s + w$ (4) $58 + s + w$

5) *Which ordered pair is not in the solution set of $y > -\frac{1}{2}x + 4$ and $y \leq 3x - 1$*

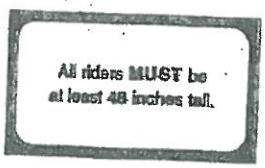
(1) (4,2) (2) (3,3) (3) (5,3) (4) (6,2)

$2 > -\frac{1}{2}(4) + 4$

$2 > -2 + 4$ $2 \not> 2$

6) *The sign shown below is posted in front of a roller coaster ride at the Wadsworth County Fairgrounds.*

If h represents the height of a rider in inches, what is a correct translation of the statement on this sign?



(1) $h < 48$ (2) $h > 48$ (3) $h \leq 48$ (4) $h \geq 48$

7) *Which value of x is the solution of the equation $\frac{2x}{3} + \frac{x}{6} = 5$?*

$\left(\frac{4x}{6} + \frac{x}{6} = \frac{30}{6}\right)6$

$5x = 30$

$x = 6$

(1) 6 (2) 10 (3) 15 (4) 30

8) *What is* $\frac{6}{4a}-\frac{2}{3a}$ *expressed in simplest form?*

(1) $\frac{4}{a}$ (2) $\frac{5}{6a}$ (3) $\frac{8}{7a}$ (4) $\frac{10}{12a}$

$\frac{6\cdot 3}{4a\cdot 3}-\frac{2\cdot 4}{3a\cdot 4}$

$\frac{18}{12a}-\frac{8}{12a}=\frac{10}{12a}=\frac{5}{6a}$

9) *Given real numbers a, b, c, d and e such that c<d, e<c, e>b, and b>a, which of these numbers is the greatest?*

(1) a (2) b (3) c (4) e

b<e<c<d

"d" ~~#~~ greatest ~~#~~ but of the choices we would pick "c"

10) *What is* $\sqrt{32}$ *expressed in simplest radical form?*

(1) $16\sqrt{2}$ (2) $4\sqrt{2}$ (3) $4\sqrt{8}$ (4) $2\sqrt{8}$

$\sqrt{16}\sqrt{2}$

11) *If the speed of sound is 344 meters per second, what is the approximate speed of sound, in meters per hour?*

(1) 20,640 (2) 41,280 (3) 123,840 (4) 1,238,400

12) *The sum of two numbers is 47, and their difference is 15. What is the larger number?*

(1) 16 (2) 31 (3) 32 (4) 36

$x+y=47$
$+\ x-y=15$
$2x=62$
$x=31$

$31+y=47$
$y=16$

13) *If* $a+ar=b+r$, *the value of a in terms of b and r can be expressed as*

(1) $\frac{b}{r}+1$ (2) $\frac{1+b}{r}$ (3) $\frac{b+r}{1+r}$ (4) $\frac{1+b}{r+b}$

$\frac{a(1+r)}{1+r}=\frac{b+r}{1+r}$

14) *Which value of x is in the solution set of* $\frac{4}{3}x+5<17$?

(1) 8 (2) 9 (3) 12 (4) 16

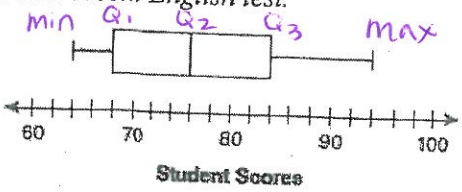
$\left(\frac{3}{4}\right)\frac{4}{3}x<12\left(\frac{3}{4}\right)$

$x<9$

15) *The box-and-whisker plot below represents students' scores on a recent English test.*

What is the value of the upper quartile?

(1) 68 (2) 76 (3) 84 (4) 94



16) Which value of n makes the expression $\frac{5n}{2n-1}$ undefined?

(1) 1 (2) 0 (3) $-\frac{1}{2}$ (4) $\frac{1}{2}$

$2n-1=0$
$2n=1$
$n=1/2$

17) At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?

(1) 202 (2) 205 (3) 235 (4) 236

Let x = fresh
Let $x+60$ = soph
Let $2x-50$ = jun.
Let $3x$ = sen.

$x+x+60+2x-50+3x=1424$
$7x+10=1424$
$7x=1414$
$x=202$

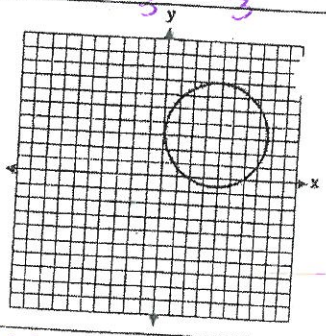
18) What is the value of the y-coordinate of the solution to the system of equations $x+2y=9$ and $x-y=3$?

(1) 6 (2) 2 (3) 3 (4) 5

$-1(x-y=3)$
$+\ x+2y=9$
$-x+y=-3$
$\frac{3y}{3}=\frac{6}{3}$
$\boxed{y=2}$

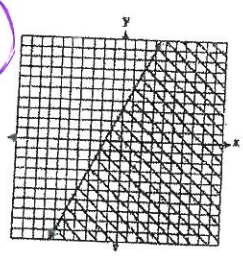
19) Which statement is true about the relation shown on the graph below?

(1) It is a function because there exists one x-coordinate for each y-coordinate.
(2) It is a function because there exists one y-coordinate for each x-coordinate.
(3) It is not a function because there are multiple y-values for a given x-value.
(4) It is not a function because there are multiple x-values for a given y-value.



20) Which graph represents the solution of $3y-9\le 6x$?

$y\le 2x+3$
solid line

1)


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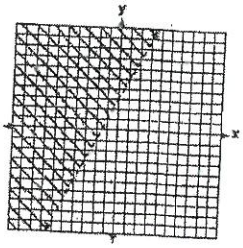

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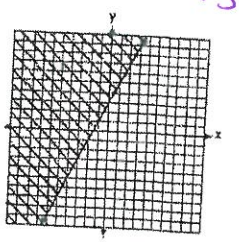

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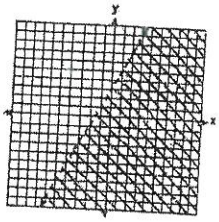


21) *Which expression represents* $\frac{x^2-2x-15}{x^2+3x}$ *in simplest form?*

$\frac{(x-5)\cancel{(x+3)}}{x\cancel{(x+3)}}$

(1) -5 (2) $\frac{x-5}{x}$ (3) $\frac{-2x-5}{x}$ (4) $\frac{-2x-15}{3x}$

22) *What is an equation of the line that passes through the point (4,-6) and has a slope of -3?*

(1) $y = -3x + 6$ (2) $y = -3x - 6$ (3) $y = -3x + 10$ (4) $y = -3x + 14$

$y+6=-3(x-4)$
$y+6=-3x+12$
$y=-3x+6$

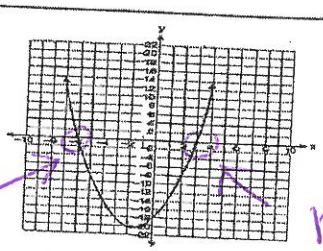
23) *When* $4x^2 + 7x - 5$ *is subtracted from* $9x^2 - 2x + 3$, *the result is*

(1) $5x^2 + 5x - 2$ (2) $5x^2 - 9x + 8$ (3) $-5x^2 + 5x - 2$ (4) $-5x^2 + 9x - 8$

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

24) *The equation* $y = x^2 + 3x - 18$ *is graphed on the set of axes below. Based on this graph, what are the roots of the equation* $x^2 + 3x - 18 = 0$ *?*

(1) – 3 and 6 (2) 0 and 18 (3) 3 and – 6 (4) 3 and -18



root root

Part II

Answer all 8 questions in this part. Each correct answer will receive 2 points. Clearly indicate the necessary steps, including appropriate formulas substitutions, diagrams, graphs, charts, etc. For all questions, in this part, a correct numerical answer with no work shown will receive only 1 credit.

25) *Factor completely:* $4x^3 - 36x$

$4x(x^2-9)$

$\boxed{4x(x-3)(x+3)}$

~~26) *Jane wants to make trail mix made up of almonds, walnuts and raisins. She wants to mix one part almonds, two parts walnuts, and three parts raisins. Almonds cost $12 per pound, walnuts cost $10.50 per pound, and raisins cost $4 per pound. Jane has $15 to spend on the trail mix. Determine how many pounds of trail mix she can make.*~~

Omit

$\frac{2}{3} \div 6 = \frac{2}{3} \cdot \frac{1}{6} = \frac{2}{18} = \frac{1}{9}$

$\frac{1}{9}$ of the book must be read each day remaining

27 *For English class, Gary must read Grapes of Wraft in 10 days. He reads* $\frac{1}{12}$ *of the book each day the first 4 days. For the remaining 6 days, what fraction of the book must Gary read per day?*

$\frac{1}{12} \cdot \frac{4}{1} = \frac{1}{3}$ book is read $\rightarrow$ $\frac{2}{3}$ is left to read over 6 days

28 *Mr James is 4 times as old as his son. In 16 years he will be only twice as old. What is the age of the son now.*

Let x = son
Let $4x$ = Mr. James

in 16 years
son $= x+16$
Mr. J $= 4x+16$

$4x+16 = 2(x+16)$
$4x+16 = 2x+32$
$2x = 16$
$x = 8$

The son is 8 years old

29 *A rectangle's length is 14 cm more than its width. The perimeter is 264 cm. Find the dimensions of the rectangle.*

$x+14$

x

$2(x)+2(x+14)=264$
$2x+2x+28=264$
$4x=236$
$x=59$

length = 73 cm
width = 59 cm

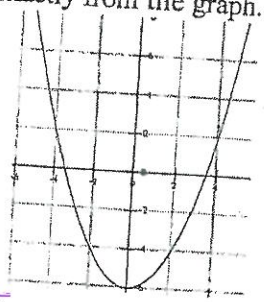
30 *Solve for x :* $\frac{2x-3}{x-4} = \frac{2}{3}$

$3(2x-3) = 2(x-4)$
$6x-9 = 2x-8$
$4x = 1$
$x = \frac{1}{4}$

31 Jane is given the graph of the function $y = \frac{1}{2}x^2 - 6$

She wants to find the zeroes of the function but is unable to read them exactly from the graph. Find the zeroes in simplest radical form.

$0 = \frac{1}{2}x^2 - 6$
$+6 \qquad +6$
$2(6) = (\frac{1}{2}x^2)\,2$
$\pm\sqrt{12} = \sqrt{x^2}$
$x = \pm 2\sqrt{3}$



32 *Express in simplest form:* $\frac{45a^4b^3 - 90a^3b}{15a^2b}$

$\frac{45a^3b(a-2)}{15a^2b} = 3a(a-2)$

Part III

Answer all 4 questions in this part. Each correct answer will receive 4 points. Clearly indicate the necessary steps, including appropriate formulas substitutions, diagrams, graphs, charts, etc. For all questions, in this part, a correct numerical answer with no work shown will receive only 1 credit.

33) *A bank is advertising that new customers can open a savings account with a* $3\frac{3}{4}\%$ *interest rate compounded annually. Robert invests $5,000 in an account at this rate. If he makes no additional deposits or withdrawals on his account, find the amount of money he will have, to the nearest cent, after three years.*

$A = P(1 \pm r)^t$

$A = 5000(1 + .0375)^3 = \boxed{\$5583.86}$

34) *The table below shows the number of prom tickets sold over a ten-day period.* Answers vary

Prom Ticket Sales

Day (x)	1	2	5	7	10
Number of Prom Tickets Sold (y)	30	35	55	60	70

Plot these data points on the coordinate grid below. Use a consistent and appropriate scale. Draw a reasonable line of best fit and $\boxed{\text{write its equation.}}$

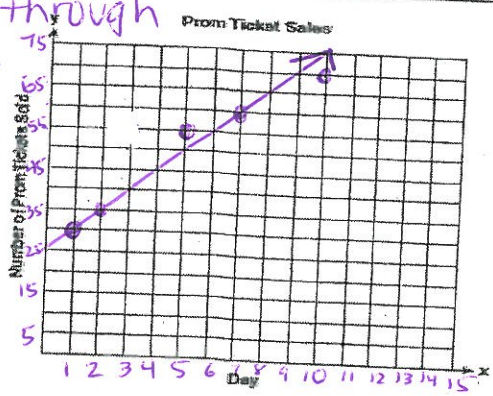
line of best fit: must go through two data points

* NOT Regression Line *

(2,35)(7,60)

$m = \frac{60-35}{7-5} = \frac{25}{2}$

$\boxed{y - 35 = \frac{25}{2}(x-2)}$



35 Find the roots of the equation $x^2 = 30 - 13x$ algebraically.

$x^2 + 13x - 30 = 0$

$0 = (x+15)(x-2) = 0$

$-15 \quad -15 \quad +2 \quad +2$

$\boxed{x = \{-15, 2\}}$

36 The Booster Club raised $30,000 for a sports fund. No more money will be placed into the fund. Each year the fund will decrease by 5%. Determine the amount of money, to the nearest cent, that will be left in the sports fund after 4 years.

$A = P(1+r)^t$

$A = 30{,}000(1 - .05)^4$

$\boxed{A = \$24{,}435.19}$

Part IV

Answer all 1 questions in this part. Each correct answer will receive 4 points. Clearly indicate the necessar steps, including appropriate formulas substitutions, diagrams, graphs, charts, etc. For all questions, in this part, a correct numerical answer with no work shown will receive only 1 credit.

37 *A man is climbing down a ladder that is 10 feet high. At time 0 seconds, his shoes are 10 feet above the floor, and at time 6 seconds, his shoes are at 3 feet. From time 6 seconds to the 8.5 second mark, he drinks some water on the step 3 feet off the ground. When he completes drinking the water, he takes 1.5 seconds to reach the ground and then he walks into the living room.*

a) *Draw a graph representing this story*

b) *What does the horizontal line segment represent in your graph?*

The man stopped to drink water.

c) *If you measured from the top of the man's head instead of his shoes, how would your graph change if he is 6 feet tall.*

Man Climbing Down Ladder

Vertical shift up six