Math Practice Test 8
"More Practice" Answer Key

1. **E**

Solve for the value of a:
$a - 3 = 5$
$a = 5 + 3$
$a = 8$

Substitute the value of a:
$2a - 3$
$2(8) - 3 = 16 - 3 = \mathbf{13}$

2. **C**

a. $(2a)^2 = (2^2)(a^2) = 4a^2$
b. $x^5 - x^3 = (x^3)(x^2-1)$
c. $a^3 + a^3 = (a^3)(1+1) = \mathbf{2a^3}$
d. $(x+y)^2 = x^2+2xy+y^2$

3. **C**

a. $\frac{1}{a} + \frac{1}{b} = \frac{b}{ab} + \frac{a}{ba} = \frac{b+a}{ab}$
b. $\sqrt{3} - \sqrt{2} = 1.732 - 1.414 = 0.318$
c. $(x-y)^2 = x^2 - 2xy + y^2$

4. **A**

$P = \frac{JK}{L^2}$

Let M be the new value for P after the variables J, K or L were changed

a. If L is halved

$\mathbf{M = \frac{JK}{(\frac{1}{2}L)^2} = \frac{JK}{\frac{1}{4}L^2} = 4\frac{JK}{L^2} = 4P}$

b. If L is doubled

$M = \frac{JK}{(2L)^2} = \frac{JK}{4L^2} = \frac{1}{4}P$

c. If J is doubled

$M = \frac{(2J)(K)}{L^2} = \frac{2JK}{L^2} = 2P$

d. If L is quadrupled

$M = \frac{JK}{(4L)^2} = \frac{JK}{16L^2} = \frac{1}{16}P$

5. **A**

$0.104 - 2y = 0.02y - 0.3$
$0.104 + 0.3 = 0.02y + 2y$
$0.404 = 2.02y$
$y = 0.404/2.02 = \mathbf{0.2}$

6. **B**

$(3)(4)(8)(32)(R) = (16)(32)(12)$

$R = \frac{(16)(32)(12)}{(3)(4)(8)(32)} = \frac{(16)\cancel{(32)}(12)}{(3)(4)(8)\cancel{(32)}} = \frac{(16)\cancel{(12)}}{\cancel{(3)(4)}(8)} = \frac{\cancel{16}}{\cancel{8}} = \mathbf{2}$

7. **C**

$0.0001y = 1$
$0.0001y \times 1000 = 1 \times 1000;\ 0.1y = 1000$
$0.0001y \times 10000 = 1 \times 10000;\ 1y = 10000$
$1y + 0.1y = 10000 + 1000 = \mathbf{11000}$

8. **D**

$\frac{a \times a \times a}{a+a+a} = \frac{a^3}{3a} = \frac{a^2}{3}$

9. **A**

$5x^2y^2 + 3x^2y - 10xy - 36 + (xy(16xy - 4x + 10))$
$5x^2y^2 + 3x^2y - 10xy - 36 + 16x^2y^2 - 4x^2y + 10xy$
$= \mathbf{21x^2y^2 - x^2y - 36}$

10. **B**

$\frac{9a^4 - 3a^3 + 6a}{3a}$
$= 3a^3 - a^2 + 2$

11. **B**

$2(x^{12} - 16)$
$2(x + 4)(x - 4)$

12. **A**

Use special products

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

13. **A**

$3x^2 - kx - 2 = 0$
$3x^2 - kx = 2$
$x(3x - k) = 2$
$3x - k = \frac{2}{x}$
$3x - \frac{2}{x} = k$
$\frac{3x^2 - 2}{x} = k$

14. **C**
s = $\frac{rst + xy}{ty - r}$
sty – sr = rst + xy
sty – xy = rst + sr
(y)(st – x) = (rs)(t + 1)
r = $\frac{y(st - x)}{s(t+1)}$

15. **C**
m=$\frac{4t}{3t-2h}$
m (3t-2h)=4t
3tm-2hm=4t
3tm-4t=2hm
t(3m-4) = 2hm
t=$\frac{2hm}{(3m-4)}$

16. **A**
R = $\frac{1}{\frac{1}{X}+\frac{1}{Y}}$
Since x = $\frac{1}{3}$ and y = 1, then R =
R = $\frac{1}{\frac{1}{\frac{1}{3}}+\frac{1}{1}}$ = $\frac{1}{3+1}$ = $\mathbf{\frac{1}{4}}$

17. **D**
Use a simple example. k = 1

a. $k^2 = 1^2 = 1$; odd
b. $k^2 + 2 = 1^2 + 2 = 3$; odd
c. 2k + 1 = 2(1) + 1 = 3; odd
d. 2k +2 = 2(1) + 2 = 4; **even**
e. 2k + k/2 = 2(1) + (1/2) = 2.5;
not odd nor even.

18. **A**
x and y are integers
$\frac{x}{y}$ is negative

There are two cases:
- x is positive and y is negative
- x is negative and y is positive

I. xy
if $x = +$ and $y = -$
$(+)(-) = -$
if $x = -$ and $y = +$
$(-)(+) = -$

II. x − y
if $x = +$ and $y = -$
$(+) - (-) = +$
if $x = -$ and $y = +$
$(-) - (+) = -$

III. $\mathbf{x^5 + y^5}$
Use **S**imple **E**xample **(SE)**
If $x = -1$ and $y = 1$
$x^5 + y^5$
$(-1)^5 + (1)^5 = -1 + 1 = 0$

0 is neither positive nor negative. It is an arbitrary number.

Math Practice Test 9
"More Practice" Answer Key

1. A or C
Functions can describe one-to-one or many-to-one relationships. However, functions cannot be one-to-many relationships.

2. **A**

3. **B**
Since N is a large number, $\frac{4}{N}$ the value approaches 0. Thus, f [1- $\frac{4}{N}$] $= f[1]$.

4. **C**
The form of the parabola x = a(y-k)^2 + h where (h,k) is the vertex (x,y) of the parabola. The parabola is opening to the left, so the coefficient a of y^2 must be negative.

5. **C**

Symmetry	Test of Symmetry
x-axis	f(-y) = f(y)
y-axis	f(-x) = f(x)
At the origin	f(-x) = -f(x)
diagonal	f(x→y) = f(y→x)

Test of Symmetry
y=f(x)=$\frac{-2}{x^3}$
f(-x)=$\frac{-2}{(-x)^3}$= $\frac{-2}{-x^3} = \frac{2}{x^3} = -f(x)$
The function has symmetry at the origin.

6. **B**
Evaluate.
$f(x) = x^2 - 16$, $0 = (x+4)(x-4)$
Zeroes are 4 and -4.
The x-intercepts are the value of x when y=0. Thus, x = 4 and x = -4.

7. **D**

$$f(x) = \frac{x-2}{3(x^2-1)-8x}$$

Since it's a rational function, the denominator must not be zero.

$3(x^2 - 1) - 8x = 0$
$3x^2 - 3 - 8x = 0$
$3x^2 - 8x - 3 = 0$

Factor out:
$(x - 3)(3x + 1) = 0$
$(x - 3) = 0$ $(3x + 1) = 0$
$x = 3$ $\frac{3x}{3} = -\frac{1}{3}$ x= $-\frac{1}{3}$

The values of x should not be equal to 3 and $-\frac{1}{3}$.

The domain is the set of all real numbers Except 3 and −1/3
Domain: R – {-1/3,3}

8. **C**
28x – 4y – 12 = 0;
28x – 12 = 4y;
7x – 4 = y;
y = 7x – 4; (slope-intercept form)
slope = **7**

9. **D**

$P(1,1)$
$Q(2,y)$

The slope of line PQ is d.
m = d

To get the value of y, use "two-point slope form"

$$y_2 - y_1 = m\,(x - x_1)$$
$$P(1,1)\ P(x_1, y_1)$$
$$Q(2,y)\ Q(x_2, y_2)$$
$$y - 1 = d\,(2 - 1)$$
$$y = 2d - d + 1$$
$$y = d + 1$$

The value of y is $d + 1$.

10. **D**
x is between -5 and 7

Use Simple Example (**SE)**
x = 0, 0 is the best SE between -5 and 7
Substitute the value of x

$$x = 0$$
$$x + 5 = 0 + 5$$
$$x^2 + 15 = 0^2 + 15 = 15$$
$$x^2 + 30 = 0^2 + 30 = 30$$
$$3x + 10 = 3(0) + 10 = 10$$

$x^2 + 30$ has the greatest value

Math Practice Test 10
"More Practice" Answer Key

1. **C**

$$\frac{p+q}{p-q} = \frac{\frac{2}{3}+\frac{5}{7}}{\frac{2}{3}-\frac{5}{7}} = \frac{\frac{14+15}{21}}{\frac{14-15}{21}} = \frac{\frac{29}{21}}{-\frac{1}{21}}$$

$$= \frac{29}{21} \div -\frac{1}{21} = \frac{29}{21} x - \frac{21}{1}$$

$$= \mathbf{-29}$$

2. **A**

$$(3a^{-1}b^{2/3}c^2)^3 = 27a^{-3}b^2c^6 = \frac{27b^2c^6}{a^3}$$

$$= \frac{(27)(8)^2(-1)^6}{(-2)^3} = \frac{(27)(64)(1)}{(-8)} = \frac{(27)\overset{8}{\cancel{(64)}}(1)}{\underset{-1}{\cancel{(-8)}}}$$

$= \mathbf{-216}$

3. **E**

Substitution

If we substitute 0 as value of t,

$1 - t = \frac{t-1}{t}$ will be undefined.

$$1 - t = \frac{t-1}{t}$$

$$1 - 1 = \frac{1-1}{1} = 0$$

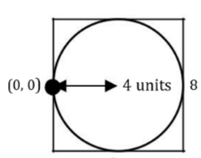
$$1 - (-1) = \frac{(-1)-1}{-1} = 2$$

-1 and 1 are values of *t*.

4. **A**

$$\left(\frac{2p^5qr^2}{3p^3q^4r^5}\right)^3 = \frac{8p^{15}q^3r^6}{27p^9q^{12}r^{15}} = \frac{8p^6}{27q^9r^9}$$

5. **E**



The center of the circle lies on the x-axis, 4 units away from the origin. Thus, (4,0).

6. **A**

$$x^3 + 3x^2 - 4 - 12$$

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

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

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

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

7. **C**

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

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

$$x^2 + 4 = 2x^2$$

$$x^2 = 4$$

x=±2

8. **C**

Standard form for:

Ellipse: $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ **or** $\frac{y^2}{a^2} + \frac{x^2}{b^2} = 1$

Hyperbola: $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ **or** $\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$

Parabola: $y = ax^2 + bx + c$

Circle: $x^2 + y^2 = r^2$

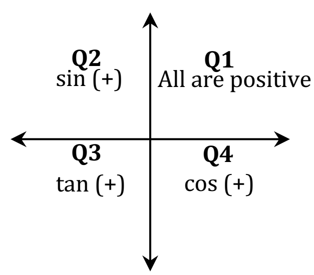
Thus, $x^2 - 4y^2 = 4$

$$\frac{x^2 - 4y^2 = 4}{4}$$

$\frac{x^2}{4} - \frac{y^2}{1} = 1$ is a **hyperbola.**

9. **B**

$\tan\theta < 0$ and $\cos\theta < 0$



Since $tan\theta$ and $cos\theta$ are both negative, the remaining possible quadrant where the θ lies is at quadrant 2 or when $sin\theta$ is positive.

10. **A**

To find the remainder, use the remainder theorem

f(x)= $x^2 + 3x + 2$

p(-1)= $(-1)^2 + 3(-1) + 2$

p(-1)= 1 - 3 + 2 = 0

Math Practice Test 11
"More Practice" Answer Key

1. **A**

$(\sqrt{27r^3})(\sqrt{3r}) = \sqrt{(27r^3)(3r)} = \sqrt{81r^4} = \mathbf{9r^2}$

2. **B**

$[(\sqrt{x})(\sqrt[4]{y})]^8 = [(x^{\frac{1}{2}})(y^{\frac{1}{4}})]^8 = [(x^{\frac{8}{2}})(y^{\frac{8}{4}})] = \mathbf{x^4y^2}$

3. **B**

$[(\sqrt[3]{x})(\sqrt[5]{x})]^{10} = [(x^{1/3})(x^{1/5})]^{10}$

$= (x^{\frac{10}{3}})\left(x^{\frac{10}{5}}\right) = (x^{\frac{10}{3}})(x^2)$

$= x^{\frac{10}{3}+2} = x^{\frac{10}{3}+\frac{6}{3}} = x^{\frac{16}{3}} = \sqrt[3]{\mathbf{x^{16}}}$

4. **C**

$\frac{10x+25p-3}{5xp+1} = 2$

$10x + 25p - 3 = (2)(5xp + 1)$

$10x + 25p - 3 = 10xp + 2$

$10x - 10xp = 2 + 3 - 25p$

$(10x)(1\text{-}p) = 5 - 25p = (5)(1 - 5p)$

$x = \frac{\cancel{5}\,(1-5p)}{\cancel{10}\,(1-p)} = \frac{\mathbf{1-5p}}{\mathbf{2(1-p)}}$

5. **A**

$a = 3b + 1$

$a - 1 = 3b$

$b = \frac{a-1}{3}$

$m = \frac{1}{a} + b$

$m = \frac{1}{a} + \frac{a-1}{3}$

$m = \frac{3}{3a} + \frac{a^2-a}{3a} = \frac{3+a^2-a}{3a} = \frac{\mathbf{a^2-a+3}}{\mathbf{3a}}$

6. **A**

$\frac{x}{z+1} = y$

$x = yz + y$

$x - y = yz$

$\frac{\mathbf{x-y}}{\mathbf{y}} = \mathbf{z}$

7. **B**

$\frac{x}{x-y} + \frac{y}{y-x}$

Multiply $\frac{y}{y-x}$ by -1

$\frac{x}{x-y} + -1\left[\frac{y}{y-x}\right]$

$\frac{x}{x-y} + -\frac{y}{-y+x}$

$\frac{x}{x-y} + -\frac{y}{-y+x}$

$\frac{x}{x-y} - \frac{y}{x-y}$

$\frac{x-y}{x-y} = \mathbf{1}$

8. **C**

$\frac{x^2}{x+x+x} = \frac{x^2}{3x} = \frac{x}{3}$

9. **C**

$(-8a^5b^2c^3)(-2a^2b^7c)^2$

$= (-8a^5b^2c^3)\,[(-2)^2(a^2)^2(b^7)^2(c^2)^2]$

$=(-8a^5b^2c^3)\,(4a^4b^{14}c^2)$

$= -32a^{5+4}b^{2+14}c^{3+2} = \mathbf{-32a^9b^{16}c^5}$

10. **C**

$x^2 - y^2 = (x + y)(x - y) = 77$

$x + y = 11$

$x - y = \frac{77}{11} = 7$

$x + y = 11$

$+\underline{x - y = 7}$

$2x = 18;\ x = \mathbf{9}$

11. **E**

Solve for the value of x – y

$x = y - 5$

$x - y = -5$

Substitute the value of x - y

$(x - y)^3$

$(-5)^3 = \mathbf{-125}$

12. **A**

$-x^2 - 3x + 36 = 3x^2 - 3x + 108$

$4x^2 = 144$

$x^2 = 36$

$x = \sqrt{36} = \pm\mathbf{6}$

13. **C**

Factor out:

$x^2 + 8x - 48 = 0$

$(x + 12)(x - 4) = 0$

$(x + 12) = 0$ and $(x - 4) = 0$

The set of roots of $x^2 + 8x - 48 = 0$ is $\{\mathbf{-12, 4}\}$**.**

14. **C**

Solve for discriminant.

a. $(-7)^2 - 4(1)(4) = 33$

b. $(-7)^2 - 4(1)(-4) = 65$

c. $(-1)^2 - 4(7)(4) = -111$

d. $(-1)^2 - 4(7)(-4) = 113$

15. **C**

$x^2 - 2ax - a^2$

Solve for the discriminant.

If $D > 0$: 2 distinct real roots

If $D = 0$: 2 two equal real roots

If $D < 0$: 2 complex (imaginary) roots

Discriminant= $b^2 - 4ac$

a=1, b=2a, c=a^2

Discriminant $= (-2a)^2 - 4(1)(-a^2)$

Discriminant $= 4a^2 + 4a^2 = 8a^2$

Since $a^2 > 0$, $8a^2 > 0$

$D > 0$ so it has 2 distinct real roots.

Math Practice Test 12
"More Practice" Answer Key

1. **D**

$$\frac{x^2-2xy+y^2}{x^2-y^2}=\frac{(x-y)(x-y)}{(x-y)(x+y)}=\frac{x-y}{x+y}=\frac{8}{4}=2$$

2. **A**

$3^y = z$

$3^{y+2} = (3^y)(3^2) = (3^y)(9) = (9)(3^y) =$ **9z**

3. **C**

Let A be Pedro's money
B be Juan's money (before giving Pedro)
C be Jose's money
B = 4C = (4)(P30) = P120
A = ½ B = (½)(P120) = P60

4. **C**

Let x be Lou's age
3x – 6 be Lee's age
x + 5 be Lou's age after 5 years
3x – 6 + 5 = 3x-1 be Lee's age after 5 years

(2)(x + 5) = 3x – 1
2x + 10 = 3x – 1
11 = x or x = **11**

5. **B**

Let x be the mother's age;
(3x – 7) be the son's age

If x = 15, then 3x – 7 = 45 – 7 = 38
She gave birth 15 years ago and her age was then 38 – 15 = **23 years old**.

6. **B**

Let x be the number of hours they worked together.

Paolo's rate = ¼
John's rate = ½

$$\frac{x}{4}+\frac{x}{2}=1$$
$$x+2x=4$$
$$3x=4$$
$$x=\frac{4}{3}=1\frac{1}{3}\text{ hours}$$

7. **B**

$$\%\text{ Alcohol}=\frac{\text{Amount of Alcohol}}{\text{Total Amount of liquids}}$$
$$=\frac{(150\text{mL}\cdot 0.2)+50\text{mL}}{150\text{mL}+50\text{mL(alcohol)}+50\text{mL(water)}}$$
$$=\frac{30\text{mL}+50\text{mL}}{250\text{mL}}=\frac{80\text{mL}}{250\text{mL}}=32\%$$

8. **C**

$$\log_2 x+\log_2(x-2)=3$$
$$\log_2 x(x-2)=3$$
$$\log_2(x^2-2x)=3$$
$$x^2-2x=2^3$$
$$x^2-2x-8=0$$
$$(x-4)(x+2)=0$$
$$x=4$$

Note: When x = 2, the value is UNDEFINED

9. **B**

Evaluate
$$\log_b(x+y)=z$$
$$b^z=x+y$$

10. **D**

$$\log_b\frac{64}{121}=?$$
$$\log_b\frac{64}{121}=\log_b 64-\log_b 121$$
$$\log_b\frac{64}{121}=\log_b 2^6-\log_b 11^2$$
$$\log_b\frac{64}{121}=6\log_b 2-2\log_b 11$$
$$y=\log_b 11\text{ and }x=\log_b 2$$

substitute the values of x and y
$$\log_b\frac{64}{121}=6x-2y$$

Math Practice Test 13
"More Practice" Answer Key

1. **B**

$\frac{x^{\frac{1}{3}}y^{-4}z^{12}}{x^5y^{1/2}z^{15}} = x^{(\frac{1}{3}-5)}y^{(-4-(\frac{1}{2}))}z^{12-15}$

$= x^{-\frac{14}{3}}y^{-\frac{9}{2}}z^{-3} = \frac{z^{-3}}{x^{\frac{14}{3}}y^{\frac{9}{2}}}$

2. **D**

Let x be Trina's age;
37 - x be Trisha's age;
x - 5 be Trina's age 5 years ago;
32 - x be Trisha's age 5 years ago;

x – 5 = (2)(32 – x)
x – 5 = 64 – 2x
3x = 64 + 5 = 69
x = **23**

3. **A**

Let x be mother's age
2x be Grandmother's age
2x – 60 be Tanisha's age

x + 2x + 2x – 60 = 150;
5x – 60 = 150;
5x = 210;
x = 42;
2x – 60 = (2)(42) – 60 = 84 – 60 = **24**

4. **A**

Let x be Jericho's age
x + 8 be Joan's age

Their ages 2 yrs from now is:
Jericho's age=x+2
Joan's age= (x+8) + 2

In 2 years, Joan will be twice as old as Jericho:

x+10=2(x + 2)
x+10= 2x+4
x= 6

5. **B**

Let x be Jaz's age.

Her grandmother is 60 + x.
Her mother is 3x - 3.

102 = x + (60 + x) + (3x - 3)
102 = 5x + 57
5x = 45
x = 9

Thus, her mother is 3(9) - 3 = **24 years old.**

6. **C**

Rate= $\frac{1}{20} + \frac{1}{60} + \frac{1}{n}$
Add $\frac{1}{20}$ *and* $\frac{1}{60} = \frac{1}{15}$
Rate= $\frac{1}{15} + \frac{1}{n}$
Rate= $\frac{15+n}{15n}$

Get the reciprocal to get the time.
Time=$\frac{15n}{15+n}$

7. **C**

$\frac{1\text{job}}{2\text{days}} + \frac{1\text{job}}{3\text{days}} = \frac{1\text{job}}{x\text{days}}$

$\frac{3+2}{6} = \frac{1}{x}$

$x = \frac{6}{5}\text{days}$

8. **C**

Change to exponential form.

log6(4x - 4) = 2

6^2 = 4x – 4

36 = 4x – 4

40 = 4x

10 = x

9. **C**
2x + y=-6 (multiply by 3)
-6x + 4y = 18

6x + 3y =-18
-6x + 4y =18

Eliminate x
7y=0
y=0

10. **C**
6x + 9y = 7 (multiply by 2)
3x – 6y = -14 (multiply by 3)

12x + 18y = 14
9x - 18y = -42

eliminate y
21x = -28

x = -28/21 = -4/3

substituting x into the second equation
3(-4/3) – 6y = -14
-4 – 6y = -14
-6y = -10
y = 10/6 = 5/3

The answer is (-4/3, 5/3).

11. **C**
$\mathrm{x} + \mathrm{y} = 1$ 1st equation
$3\mathrm{x} + 2\mathrm{y} = 5$ 2nd equation

Substitute the values of x and y to the first equation

(3, 2)
$$\mathrm{x} + \mathrm{y} = 1$$
$$3 + 2 = 5$$

Since it does not satisfy the first equation, no need to substitute the value of x to the second equation

(2, 3)
$$\mathrm{x} + \mathrm{y} = 1$$
$$2 + 3 = 5$$

Since it does not satisfy the first equation, no need to substitute to the second equation

(3, -2)
$$\mathrm{x} + \mathrm{y} = 1$$
$$3 + (-2) = 1$$

Since it does satisfy the first equation, substitute to the second equation
$$3\mathrm{x} + 2\mathrm{y} = 5$$
$$3(3) + 2(-2) = 5$$
$$5 = 5$$

No need to check letter d, the answer is C.

12. **D**
$3\mathrm{x} + \mathrm{y} = 5$ 1st equation
$2\mathrm{x} + \mathrm{y} = 4$ 2nd equation
Using elimination method, subtract the second equation from the first equation then eliminate y
$$3\mathrm{x} + \mathrm{y} = 5$$
$$-(2\mathrm{x} + \mathrm{y} = 4)$$
$$x \quad = 1$$

Then substitute the value of x
$$3\mathrm{x} + \mathrm{y} = 5$$
$$3(1) + \mathrm{y} = 5$$
$$3 + \mathrm{y} = 5$$
$$\mathrm{y} = 5 - 3$$
$$\mathrm{y} = 2$$

Substitute the value of x and y to get x+y
$$\mathrm{x} + \mathrm{y} = 1 + 2 = \mathbf{3}$$

Math Practice Test 14
"More Practice" Answer Key

1. **B**

$$f(x) = \frac{4x+8}{3-2x}$$

$$f(x-1) = \frac{4(x-1)+8}{3-2(x-1)}$$

$$f(x-1) = \frac{4x-4+8}{3-2x+2} = \frac{\mathbf{4x+4}}{\mathbf{5-2x}}$$

2. **B**

f(a) - f(a-1)

$=a^2 + 4a + 4 - [(a-1)^2 + 4(a-1) + 4]$

$=a^2 + 4a + 4 - [a^2 - 2a + 1 + 4a - 4 + 4]$

$=a^2 + 4a + 4 - a^2 - 2a - 1$

$=2a + 3$

3. **E**

$$\frac{g(m+n)-g(m)}{n} =$$

$$= \frac{(m+n)^2 - 5(m+n) + 6 - [m^2 - 5m + 6]}{n}$$

$$= \frac{m^2 + 2mn + n^2 - 5m - 5n + 6 - m^2 + 5m - 6}{n}$$

$$= 2m + n - 5$$

4. **B**

$$\frac{1job}{6days} + \frac{1job}{4days} = \frac{x}{2days}$$

$$\frac{10}{24} = \frac{x}{2}$$

$$x = \frac{5}{6}$$

5. **D**

Use synthetic division.

2	p	-1/2p	-7/2p	2
		2p	3p	-p
	p	3/2p	-1/2p	2-p

2-p ↓ remainder

To make the x-2 a factor, the reminder should be zero.

$2 - p = 0$

$p = 2$

6. **D**

Use synthetic division especially when coefficients are involved.

-3	1	a	3	-
		-3	9-3a	-
	1	-3+a	12-3a	-

$-45 + 9a = 0$

$a = 5$

7. **B**

Solve for remainder (Q_1+Q_2).

-3	1	a	3	-
		-3	9-3a	-36+9a
	1	-3+a	12-3a	**-45+9a**

2	1	k	-12	
		2	4+2k	-
	1	2+k	-8+2k	-

$Q_1 + Q_2 = 20$

$5k - 6 + 4k - 10 = 20$

$k = 4$

8. **D**

Use synthetic division especially when coefficients are involved.

-2	1	0	r	0	-8	40
		-2	4	-8-2r	16+4r	-16-8r
	1	-2	4+r	-8-2r	8+4r	24-8r

$24 - 8r = 0$

$\frac{-8r}{-8} = \frac{-24}{-8}$

$r = 3$

The value of r is 3.

9. **D**

Evaluate

$f(x) = y = \frac{7x-5}{4}$

To solve for the inverse function, interchange x and y then solve for y.

$x = \frac{7y-5}{4}$

$4x+5 = 7y$

$y = \frac{4x+5}{7}$

10. **C**

(Rewrite the indeterminate form by factoring both the numerator and denominator.)

$\lim_{x\to -3} \frac{x+3}{x^2-9} = \frac{0}{0}$

$= \lim_{x\to -3} \frac{x+3}{(x+3)(x-3)}$

(Divide out the factors x - 3, the factors which are causing the indeterminate form. The limit can now be computed.)

$= \lim_{x\to -3} \frac{1}{(x-3)}$

$= \frac{1}{(-3-3)}$

$= \frac{1}{-6}$

11. **B**

$$\frac{3x^2+1}{4x^3-x} = \frac{\frac{3x^2}{x^3}+\frac{1}{x^3}}{\frac{4x^3}{x^3}-\frac{x}{x^3}} = \frac{\frac{3}{x}+\frac{1}{x^3}}{4-\frac{1}{x^2}} = \frac{0+0}{4-0} = 0$$

12. **A**

Evaluate choices.

a. y= UNDEFINED, thus discontinuous at x=0

b. y=0

c. y=0

d. y=2

Math Practice Test 15
"More Practice" Answer Key

1. **E**

$(4.8\text{x}10^{-12})(0.8\text{x}10^{-20}) = \text{N}$

$(\mathbf{3.84x10^{-32}}) = \text{N}$

2. **D**

Since n is a positive number, the problem can be translated into this equation,

$$\frac{(n)(n)}{n + \cdots + n}$$

wherein n+...+n has n terms. We can simply rewrite it as

$$\frac{\text{n}^2}{\text{n(n)}} = \frac{\text{n}^2}{\text{n}^2} = \mathbf{1}$$

3. **A**

Simplify first the expression equal to f(x) before plugging in the expression of g(x)

$$\text{f(x)} = \frac{\text{x} - 1}{\text{x}^2 - 1} = \frac{\cancel{\text{x} - 1}}{\cancel{(\text{x} - 1)}(\text{x} + 1)} = \frac{1}{\text{x} + 1}$$

Thus,

$$\text{f(g(x))} = \frac{1}{\text{g(x)} + 1} = \frac{1}{\frac{6\text{x} - 9}{2\text{x} + 1} + 1}$$

$$= \frac{1}{\frac{6\text{x} - 9}{2\text{x} + 1} + \frac{2\text{x} + 1}{2\text{x} + 1}} = \frac{1}{\frac{6\text{x} - 9 + 2\text{x} + 1}{2\text{x} + 1}}$$

$$= \frac{1}{\frac{8\text{x} - 8}{2\text{x} + 1}}$$

$$= \mathbf{\frac{2x + 1}{8x - 8}}$$

4. **A**

$\text{f(x)} = \frac{\text{x}+1}{\text{x}^2-1} = \frac{\text{x}+1}{(\text{x}-1)(\text{x}+1)} = \frac{1}{\text{x}-1}$, $\text{x} \neq \pm 1$

$\text{g(x)} = \frac{3\text{x}+7}{2\text{x}}$

$$\text{f[g(x)]} = \frac{1}{\frac{3\text{x}+7}{2\text{x}} - 1} = \frac{1}{\frac{3\text{x}+7}{2\text{x}} - \frac{2\text{x}}{2\text{x}}} = \frac{1}{\frac{3\text{x}+7-2\text{x}}{2\text{x}}}$$

$$= \frac{1}{\frac{\text{x}+7}{2\text{x}}} = \mathbf{\frac{2x}{x+7}}$$

5. **C**

F(3) = 15

Q(3) = 17

R(3) = ?

$$\frac{\text{F(x)}}{\text{x} - 1} = \text{Q(x) r. R(x)}$$

$$\frac{\text{F(3)}}{3 - 1} = \text{Q(3) r. R(3)}$$

$$\frac{\text{F(3)}}{3 - 1} = \frac{15}{2} = 7 \text{ remainder } 1 \text{ (r. } \mathit{1}\text{)}$$

6. **D**

The expression involves an absolute value, which is always **greater than or equal to 0**. This means it can never be negative. Since 0 is already greater than −2, the inequality $|3x - 5| \leq -2$ can never be satisfied. Therefore, there is no solution set.