Extra Practice for Semester Review
MA 15300

(If none of these answers match, write E for 'none of the above'. Note: There will be 5 choices of answers for each problem on the final review.)

1) Simplify: $\dfrac{(4x^2y^{-3})^{-3}}{x^5y^5}$

A. $\dfrac{1}{64x^6y^{11}}$ *B.* $\dfrac{x^4}{64y}$ *C.* $\dfrac{y^4}{64x^{11}}$ *D.* $\dfrac{y^{14}}{64x}$

2) Simplify. Rationalize the denominator, if necessary. $\sqrt{\dfrac{3x^7}{y^3}}$

A. $\dfrac{x^3\sqrt{3x}}{y}$ *B.* $\dfrac{3x\sqrt{x^5y}}{y^2}$ *C.* $\dfrac{x^3\sqrt{3}}{y^2}$ *D.* $\dfrac{x^3\sqrt{3xy}}{y^2}$

3) Simplify: $\left(\sqrt[3]{4x^4y^2}\right)\left(\sqrt[3]{2x^3y^6}\right) =$

A. $2x^2y^2\sqrt[3]{x^2y^2}$ *B.* $2x^2y^2\sqrt[3]{x^2y}$ *C.* $2x^2y^2\sqrt[3]{xy^2}$ *D.* $2x^2y^2\sqrt[3]{xy}$

4) What is one of the factors of $3x^6+10x^5-8x^4$?

A. $(x+2)$ *B.* $(3x+2)$ *C.* $(x-4)$ *D.* $(3x-2)$

5) Simplify completely: $\dfrac{3}{x}+\dfrac{1}{2x-8}+\dfrac{-x}{x^2-16}$

A. $\dfrac{5x-24}{2x(x+4)}$ *B.* $\dfrac{5x+24}{2x(x+4)}$ *C.* $\dfrac{5x+24}{x(x-4)}$ *D.* $\dfrac{5x-24}{x(x-4)}$

6) Rationalize the denominator: $\dfrac{\sqrt{x}}{3\sqrt{x}-\sqrt{y}}$

A. $\dfrac{3x+\sqrt{xy}}{9x+y}$ *B.* $\dfrac{3x+\sqrt{xy}}{3x+y}$ *C.* $\dfrac{3x+\sqrt{xy}}{3x-y}$ *D.* $\dfrac{3x+\sqrt{xy}}{9x-y}$

7) Multiply: $(2x^2-4x+1)(x^2+x-2)$

A. $2x^4-2x^3-7x^2+9x-2$ *B.* $2x^4-5x^3-7x^2+9x-2$

C. $2x^4-2x^3-7x^2-7x-2$ *D.* $2x^4+2x^3-7x^2+9x-2$

8) Factor completely: $16x^4-y^4$

A. $(2x-y)^4$ *B.* $(4x^2-y^2)(4x^2+y^2)$

C. $(2x+y)(2x-y)(4x^2+y^2)$ *D.* $(2x+y)^2(2x-y)^2$

9) Solve for *C* and simplify. $\frac{1}{A}=9\left(\frac{1}{B}+\frac{1}{C}\right)$

A. $C=\frac{A-9B}{9AB}$ *B.* $C=\frac{B-9A}{9AB}$ *C.* $C=\frac{9AB}{B-9B}$ *D.* $C=\frac{9AB}{B-9A}$

10) If one person can mow the lawn in 50 minutes alone and a second person can mow it in 30 minutes alone, how long would it take to mow the lawn if they both worked together?

A. 80 minutes *B.* 20 minutes *C.* 18.75 minutes *D.* 21.25 minutes

11) A solar heating panel requires 150 gallons of a fluid that is 55% antifreeze. The fluid comes in either a 75% or a 30% solution. How many gallons of the 75% solution should be used to prepare the mixed solution?

A. $83\frac{1}{3}$ gallons *B.* 50 gallons *C.* $66\frac{2}{3}$ gallons *D.* 100 gallons

12) Solve this equation: $(x-4)(x+2)=6$

A. $x=-1+\sqrt{3},\ -1-\sqrt{3}$ *B.* $x=1+\sqrt{3},\ -1-\sqrt{3}$

C. $x=1+\sqrt{15},\ 1-\sqrt{15}$ *D.* $x=-1+\sqrt{15},\ -1-\sqrt{15}$

13) Solve this equation: $\frac{3x}{x-3}+\frac{-3}{x+3}=\frac{54}{x^2-9}$

A. $x=-5,\ 3$ *B.* $x=-7$ *C.* $x=-5$ *D.* $x=-7,\ 3$

14) Divide this complex numbers. Write your answer in the form $a + bi$. $\dfrac{-2-5i}{-4+5i}$

A. $\dfrac{33}{41}+\dfrac{10}{41}i$ *B.* $\dfrac{17}{25}-\dfrac{6}{5}i$ *C.* $-\dfrac{17}{41}+\dfrac{30}{41}i$ *D.* $-\dfrac{33}{25}-\dfrac{2}{5}i$

15) Solve for x: $\sqrt{2x+87}+x=6$

A. $x=-3$ *B.* $x=-3, 17$ *C.* $x=15, 17$ *D.* $x=15$

16) Solve for x: $x^4-3x^2+2=0$

A. $x=-1,\ 0,\ 2$ *B.* $x=0,\ 1,\ 2$ *C.* $x=1,\ 2$ *D.* $x=-\sqrt{2},\ \sqrt{2},\ -1, 1$
E. No solution

17) Solve and express your answer using interval notation. $\left|\dfrac{2-5x}{4}\right|>3$

A. $(-\infty,-2)\cup(\frac{14}{5},\infty)$ *B.* $(-2,\frac{14}{5})$ *C.* $(-\infty,-2)\cup(2,\infty)$ *D.* $(-2,2)$

18) Solve and express your solution using interval notation. $-4x^2+17x+15\le 0$

A. $\left(-\infty,-\frac{3}{4}\right]\cup[5,\infty)$ *B.* $\left(-\infty,-\frac{4}{3}\right]\cup\left[\frac{1}{5},\infty\right)$
C. $(-\infty,-5)\cup\left[\frac{3}{4},\infty\right)$ *D.* $\left(-\infty,-\frac{1}{5}\right]\cup\left[\frac{4}{3},\infty\right)$

19) Write $(2+i)+(3-i)^2$, where i is the imaginary unit, as a complex number $a + bi$.

A. $10-5i$ *B.* $10+5i$ *C.* $-10-5i$ *D.* $-10+5i$

20) Solve: $2|3x-1|-4=20$

A. $x=\dfrac{13}{3}$ *B.* $x=-\dfrac{11}{3},\ \dfrac{13}{3}$ *C.* $x=\dfrac{13}{3}, 3$ *D.* no solution

21) Solve: $0\le\dfrac{-3-3x}{5}<5$

A. $\left[-\frac{28}{5},-1\right]$ *B.* $\left(-1,-\frac{28}{3}\right)$ *C.* $\left(-\frac{28}{3},-1\right]$ *D.* $\left[-\frac{28}{3},-1\right)$

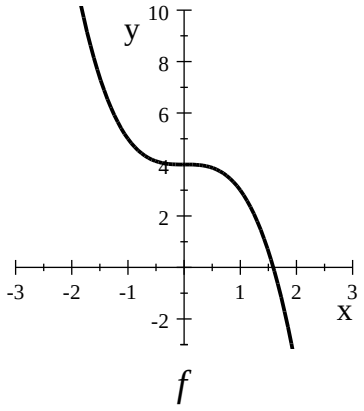
22) Find the midpoint of the segment connecting the points $A(-6,4)$ and $B(4,-5)$.

A. $\left(5,-\frac{9}{2}\right)$ *B.* $(-2,-1)$ *C.* $\left(-1,-\frac{1}{2}\right)$ *D.* $\left(-5,\frac{9}{2}\right)$

23) Which equation best describes the graph of *f*?

A. $f(x)=-x^2+4$ *B.* $f(x)=x^3-4$

C. $f(x)=-x^3+4$ *D.* $f(x)=-x+4$



f

24) Find the slope-intercept form of the line that passes through the points $(4,3)$ and $(-3,7)$.

A. $y=-\frac{7}{4}x+4$ *B.* $y=-\frac{4}{7}x-\frac{5}{7}$ *C.* $y=-\frac{7}{4}x+10$ *D.* $y=-\frac{4}{7}x+\frac{37}{7}$

25) Evaluate the difference quotient, $\frac{f(a+h)-f(a)}{h}$ if $f(x)=3x^2-4x+12$.

A. $6a+3h$ *B.* $3h-4$ *C.* $\frac{3h^2-4h+12}{h}$ *D.* $6a+3h-4$

26) Find the domain of $g(x)=\frac{\sqrt{3x-1}}{x^2-7x+10}$.

A. $\left[\frac{1}{3},2\right)\cup(2,5)\cup(5,\infty)$ *B.* $\left[\frac{1}{3},\infty\right)$

C. $(-\infty,2)\cup(2,5)\cup(5,\infty)$ *D.* $\left(-\infty,\frac{1}{3}\right]\cup(2,5)\cup(5,\infty)$

27) A hot-air balloon is released at 1 PM and rises vertically at a rate of 2 meters per second. An observation point is situated 49 meters from a pont on the ground directly below the balloon. If t denotes the time in seconds after 1 PM, express the distance d between the balloon and the observation point as a function of t.

A. $d(t) = \sqrt{2401 + 4t^2}$ *B.* $d(t) = \sqrt{2401 + 2t^2}$

C. $d(t) = 2401 + 4t^2$ *D.* $d(t) = 2401 + 2t^2$

28) If the point $P(5, -1)$ is on the graph of function f, find the corresponding point on the graph of $y = 7\,f(x+2) - 3$.

A. $(7, -10)$ *B.* $(3, -4)$ *C.* $(3, -10)$ *D.* $(7, -4)$

29) Given the piece-wise defined function below, find the value of $f(-3) + f(-2) + f(2)$.

$$f(x) = \begin{cases} -5 & \text{if} \quad x < -2 \\ x^2 & \text{if} \quad -2 \le x < 2 \\ x + 1 & \text{if} \quad x \ge 2 \end{cases}$$

A. -3 *B.* 2 *C.* 3 *D.* 17

30) Find the standard form of the equation for a parabola with vertex $V(-2, 5)$ and passing through the point $P(-1, 6)$.

A. $y = -5(x+2)^2 + 5$ *B.* $y = (x-5)^2 - 2$

C. $y = (x+1)^2 + 6$ *D.* $y = (x+2)^2 + 5$

31) Express the quadratic function $f(x) = 2x^2 + 6x - 7$ in standard form.

A. $f(x) = 2\left(x + \frac{3}{2}\right)^2 - \frac{23}{2}$ *B.* $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{23}{4}$

C. $f(x) = \left(x + \frac{3}{2}\right)^2 + \frac{5}{4}$ *D.* $f(x) = 2\left(x + \frac{3}{2}\right)^2 - 10$

32) Given that $f(x) = 2x^2 - 2x + 5$ and $g(x) = 2x + 3$, find $(f \circ g)(x)$.

A. $8x^2 + 8x + 1$ *B.* $8x^2 + 20x + 29$ *C.* $8x^2 + 20x + 1$ *D.* $8x^2 + 20x + 17$

33) Find $(fg)(x)$ if $f(x)=\dfrac{x-1}{x^2-4}$ and $g(x)=x^2$.

A. $\dfrac{x^2-1}{x^4-4}$ *B.* $\dfrac{x^3-x^2}{x^2-4}$ *C.* $\dfrac{x-1}{x^4-4x^2}$ *D.* $\left(\dfrac{x-1}{x^2-4}\right)^2$

34) Find the inverse function for $f(x)=8x^2+3$ if $x\geq 0$.

A. $f^{-1}(x)=\sqrt{\dfrac{x-3}{8}}$ *B.* $f^{-1}(x)=-\sqrt{\dfrac{x}{8}-3}$ *C.* $f^{-1}(x)=\sqrt{\dfrac{x}{8}-3}$ *D.* $f^{-1}(x)=-\sqrt{\dfrac{x-3}{8}}$

35) In which formula is *y* inversely proportional to the square of *x* and directly proportional to the cube of *z*?

A. $y=\dfrac{kx^2}{z^3}$ *B.* $y=kx^2z^3$ *C.* $y=\dfrac{kz^3}{x}$ *D.* $y=\dfrac{kz^3}{x^2}$

36) Express the following statement as a formula and determine the constant of proportionality from the given conditions: *y* is directly proportional to the square root of *x* and inversely proportional to the cube of *z*. If $x = 25$ and $z = 5$, then $y = 18$.

A. $y=\dfrac{18\sqrt{x}}{25z^3}$ *B.* $y=\dfrac{18z^3}{25\sqrt{x}}$ *C.* $y=\dfrac{450\sqrt{x}}{z^3}$ *D.* $y=\dfrac{450z^3}{\sqrt{x}}$

37) True or false? The triangle with vertices at points below is a right triangle.
$A(-5,4)$, $B(4,-4)$, and $C(0,6)$

TRUE FALSE

38) True or false? The lines with equations below are perpendicular.
$4x+5y=20$ and $4y-5x=-12$

TRUE FALSE

39) True or false? The maximum value of the function below is –1.
$f(x)=-5x^2+10x-7$

TRUE FALSE

40) A child weighs 32 pounds at age 2 and 57 pounds at age 4. If childhood weight W (in pounds) is linearly related to age t (in years), what did the child weigh at birth?

A. 5 lb. *B.* 8 lb. *C.* 9 lb. *D.* 6 lb.

41) Suppose the function $y = f(x)$ has been graphed. In terms of that graph, describe the location of the graph of $y = f(x-3)+1.$

A. shifted 3 units right and shifted one unit up
B. shifted 3 units left and shifted one unit up
C. shifted one uni5t right and 3 units down
D. shifted one unit right and 3 units up

42) True or false? The value of $i^{48} - i^{42}$ is 2, where i is the complex unit.

TRUE FALSE

Answers for the Extra Practice for Semester Review
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Problem	Answer	Problem	Answer
1)	*C*	2)	*D*
3)	*C*	4)	*D*
5)	*B*	6)	*D*
7)	*A*	8)	*C*
9)	*D*	10)	*C*
11)	*A*	12)	*C*
13)	*C*	14)	*C*
15)	*A*	16)	*D*
17)	*A*	18)	*A*
19)	*A*	20)	*B*
21)	*C*	22)	*C*
23)	*A*	24)	*D*
25)	*D*	25)	*D*
26)	*A*	27)	*A*
28)	*C*	29)	*B*
30)	*D*	31)	*A*
32)	*D*	33)	*B*
34)	*A*	35)	*D*
36)	*C*	37)	TRUE
38)	TRUE	39)	FALSE
40)	*E*	41)	*A*
42)	TRUE		