1. Find all real solutions of the equation $(x+7)^2 = 16$.

   a) $x = -3, x = -11$

   b) $x = -11, x = 11$

   c) $x = 4, x = -4$

   d) $x = -4, x = -4$

   e) $x = 3, x = 11$

2. A father is four times as old as his daughter. In 5 years, he will be three times as old as she is. How old is the daughter now?

   a) 6 years old

   b) 10 years old

   c) 15 years old

   d) 5 years old

   e) 4 years old

3. Solve $x^2 - 4x - 12 = 0$.

   a) $x = -6, x = -2$

   b) $x = 6, x = -2$

   c) $x = -6, x = -4$

   d) $x = 6, x = 2$

   e) $x = 4, x = 12$

4. It took a crew 4 hours to row 12 km upstream and back again. If the rate of flow of the stream was 4 km/h, what was the rowing rate of the crew in still water?

   a) 10 km/h

   b) 8 km/h

   c) 11 km/h

   d) 12 km/h

   e) 6 km/h

5. Find all solutions of the equation $x^2 - 4x + 12 = 0$.

   a) $x = 2 + 3i, x = 2 - 3i$

   b) $x = 2, x = -2$

   c) $x = 8 + 8i, x = 8 - 8i$

   d) $x = 4 + 12i, x = 4 - 12i$

   e) $x = 2 + 2i, x = 2 - 2i$

6. Find all real solutions of the equation $(x+1)^2 - 9(x+1) + 18 = 0$.

   a) $x = 2, x = -6$

   b) $x = 2, x = 5$

   c) $x = 4, x = 10$

   d) $x = -2, x = -5$

   e) $x = -1, x = 9$

7. Solve $\frac{1}{8} < \frac{2x-1}{16} \leq \frac{3}{4}$.

   a) $\left(\frac{3}{2}, \frac{13}{2}\right]$

   b) $\left(\frac{7}{2}, \frac{13}{2}\right]$

   c) $\left[-\frac{3}{2}, \frac{13}{2}\right)$

   d) $\left[-\frac{7}{2}, \frac{13}{2}\right)$

   e) $\left(\frac{11}{2}, \frac{19}{2}\right]$

8. Solve $|x+1| \geq 8$.

   a) $[-9, 7]$

   b) $[7, \infty)$

   c) $(-\infty, -9) \cup (7, \infty)$

   d) $(-\infty, -9] \cup [7, \infty)$

   e) $[8, \infty)$

9. If the points $P(4,5)$, $Q(0,9)$, and $R(-4,5)$ are drawn on a coordinate plane, where must the point S be located so that the figure $PQRS$ is square?

   a) $(0,2)$

   b) $(0,1)$

   c) $(0,0)$

   d) $(-1,0)$

   e) $(1,0)$

10. Find the center and radius of the circle with the equation of $x^2 + y^2 + 4x = 0$.

    a) center $(2,0)$, radius 4

    b) center $(-2,0)$, radius 5

    c) center $(-2,0)$, radius 4

    d) center $(0,-2)$, radius 4

    e) center $(-2,0)$, radius 2

11. Determine the correct equation for the line passing through the point $(4, 9)$ which is parallel to the line passing through both of the points $(7, 4)$ and $(-1, 68)$.

a) $y = -8x + 41$

b) $y = -8x - 41$

c) $y = -8x + \frac{1}{41}$

d) $y = -9x - \frac{1}{41}$

e) $y = 8x + \frac{1}{41}$

12. Determine the area of the triangle formed by the coordinate axes and the line $9x + 6y - 54 = 0$.

a) $a = 26$

b) $a = 25$

c) $a = 27$

d) $a = 29$

e) $a = 28$

13. Determine the equation which expresses that R is proportional to m and inversely proportional to B and y where a, b, and c are constants.

a) $R = \frac{cm}{BR}$

b) $R = \frac{a}{bc}$

c) $R = \frac{bB}{ym}$

d) $R = \frac{ay}{mB}$

e) $R = \frac{cm}{yB}$

14. For the function $f(x) = 2x^2 + 7$, find $\frac{f(a+h) - f(a)}{h}$ where $h \neq 0$.

a) $2h + 4a$

b) $4h + 2a$

c) $2h + 2a$

d) $6h + 4a$

e) $2h + 8$

15. Determine which of the equations below defines y as a function of x.

a) $x^{10} + (y - 12)^2 = 24$

b) $10y^2 = x$

c) $13y^{\frac{4}{3}} = x^7$

d) $10x + |y| = 21 + x^2$

e) $x^{10}y + y(x - 60) = 11$

16. What is the average rate of change of the function $f(x) = 2x - 6$ between $x = 8$ and $x = 9$?

a) 2

b) 5

c) 1

d) -1

e) 3

17. The function $f(x)$ is reflected in the x-axis and then shifted up 2 units and the graph of $g(x) = 2 - x^2$ is obtained. What is $f(x)$?

a) $f(x) = -x^2$

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

c) $f(x) = -x^2 + 2$

d) $f(x) = x^2 - 2$

e) $f(x) = x^2$

18. Find the maximum value of the function $f(x) = -2x^2 + 24x - 40$.

a) 32

b) -6

c) 6

d) -32

e) 37

19. For $f(x) = x^6 + 6$, $g(x) = x - 10$, and $h(x) = \sqrt{x}$ find $f \circ g \circ h$

a) $(f \circ g \circ h)(x) = \sqrt{x^6 - 4}$

b) $(f \circ g \circ h)(x) = (\sqrt{x} - 4)^6$

c) $(f \circ g \circ h)(x) = (\sqrt{x} - 10)^6 + 6$

d) $(f \circ g \circ h)(x) = x^6 + x - 4 + \sqrt{x}$

e) $(f \circ g \circ h)(x) = (x^6 + 6)(x - 10)\sqrt{x}$

20. Find the inverse function of $f(x) = \dfrac{1}{x+8}$.

a) $f^{-1}(x) = x + 8$

b) $f^{-1}(x) = \dfrac{1}{x} - 8$

c) $f^{-1}(x) = \dfrac{1}{x} + 8$

d) $f^{-1}(x) = \dfrac{1}{x-8}$

e) $f^{-1}(x) = x - 8$

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ITEM NO.	FORM: A
1	A
2	B
3	B
4	B
5	E
6	B
7	A
8	D
9	B
10	E
11	A
12	C
13	E
14	A
15	E
16	A
17	E
18	A
19	C
20	B