Topic: Functions

**02.01**

$a^2 + 2ab$

$= (-5)^2 + (2 \times -5 \times -4)$

$= 25 + 40$

$= 65$

**02.02**

$20 - 4x^2y$

$= 20 - (4 \times (-1)^2 \times 3)$

$= 20 - (4 \times 1 \times 3)$

$= 20 - 12 = 8$

**02.03**

$f(x) = 4^x$

$f\left(\frac{3}{2}\right) = 4^{\frac{3}{2}}$

$= \left(\sqrt{4}\right)^3$

$= 2^3 = \underline{8}$

**02.04**

$f(x) = 3\sqrt{x}$

$f(12) = 3\sqrt{12}$

$= 3 \times 2\sqrt{3}$

$= \underline{6\sqrt{3}}$

$\sqrt{12} = \sqrt{4}\sqrt{3} = 2\sqrt{3}$

**02.05**

$f(x) = \frac{3}{\sqrt{x}}$

$f(2) = \frac{3}{\sqrt{2}}$

$= \frac{3}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{3\sqrt{2}}{2}$

**02.06**

$f(x) = 4\sqrt{x} + \sqrt{2}$

$f(72) = 4\sqrt{72} + \sqrt{2}$

$= 4 \times 6\sqrt{2} + \sqrt{2}$

$= 24\sqrt{2} + \sqrt{2}$

$= 25\sqrt{2}$

$\sqrt{72} = \sqrt{36}\sqrt{2} = 6\sqrt{2}$

Topic: Functions

**02.07**

$A = 2x^2 - y^2$

$A = 2(3)^2 - (-4)^2$

$= 2(9) - 16$

$= 18 - 16$

$A = 2$

**02.08**

$f(x) = 2x - 5x^2$

$f(-2) = 2(-2) - 5(-2)^2$

$= -4 - 5(4)$

$= -4 - 20$

$= -24$

**02.09**

$f(x) = 3^x$

a) $f(4) = 3^4 = 81$

b) $f(x) = 3^x \quad f(x) = \sqrt{27}$

$3^x = \sqrt{27}$

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

$3^{\frac{2}{3}} = \sqrt{3}^3$

$= \sqrt{27}$

**02.10**

$h(t) = 15t - 3t^2$

$h(-2) = 15(-2) - 3(-2)^2$

$= -30 - 3(4)$

$= -30 - 12$

$= -42$

**02.11**

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

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

$= \frac{3}{\frac{1}{9}}$

$= 3 \div \frac{1}{9} = 3 \times \frac{9}{1} = 27$

**02.12**

$f(x) = 3x + 2$

$f(a) = 23 \quad f(a) = 3a + 2$

$3a + 2 = 23$

$3a = 21$

$a = 7$

Topic: _____

**02.13**

$f(x) = 4 - x^2$

$f(-3) = 4 - (-3)^2$

$= 4 - 9$

$= -5$

**02.14**

$f(m) = m^2 - 3m$

$f(-5) = (-5)^2 - 3(-5)$

$= 25 + 15$

$= 40$

**02.15**

$f(x) = x^2 + 2x - 1$

$g(x) = 5x + 3$

$f(x) = g(x)$

$x^2 + 2x - 1 = 5x + 3$

$x^2 + 2x - 1 - 5x - 3 = 0$

$x^2 - 3x - 4 = 0$

$(x + 1)(x - 4) = 0$

$x = -1 \quad x = 4$

**02.16**

$f(x) = 7 - 4x$

$f(-2) = 7 - 4(-2)$

$= 7 + 8$

$= 15$

**02.17**

$f(x) = x^2 + 5x$

$f(-3) = (-3)^2 + 5(-3)$

$= 9 - 15$

$= -6$

**02.18**

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

a) $f(-4) = (-4)^2 + 3$

$= 16 + 3$

$= 19$

b) $f(t) = 52 \quad f(t) = t^2 + 3$

$t^2 + 3 = 52$

$t^2 = 49$

$t = +7$ or $-7$

Topic: Functions

02.19 $I = \frac{20}{2^c}$

a) $I = \frac{20}{2^3} = \frac{20}{8} = \frac{5}{2} = 2 \cdot 5$

b) $I = \frac{20}{2^c}$ *change subject to $2^c$*

$2^c \times I = 20$

$2^c = \frac{20}{I} \Rightarrow 2^c = \frac{20}{10}$

$2^c = 2 \quad c = 1$

c) max = 20 when $c = 0$ (since $2^0 = 1$)