

FINANCE

F1. A sweater costs \$55. Calculate the price after tax (tax at 12%).

F2. A car costs \$12995. Documentations fees are \$299. Calculate the total to pay after tax (12%). (tax is paid on both the car and the documentation fees).

When buying a home in BC, the buyer must pay property transfer tax. This is calculated as follows:



General Property Transfer Tax

The general property transfer tax applies for all taxable transactions. The general property transfer tax rate is:

- 1% of the fair market value up to and including \$200,000
- 2% of the fair market value greater than \$200,000 and up to and including \$2,000,000
- 3% of the fair market value greater than \$2,000,000

F3. A house in BC is bought for \$550,000. Calculate the property transfer tax.

F4. A house in BC is bought for \$2,300,000. Calculate the property transfer tax.

F5. Calculate the future value of an investment of \$9100 after 5 years at an interest rate of 5.6% p/a, compounded daily.

F6. Calculate the interest on an investment of \$7900 after 10 years at an interest rate of 1.4% p/a, compounded weekly.

F7. Calculate the rate of return on an investment of \$6000 after 25 years at an interest rate of 3.5% p/a, compounded monthly.

F8. After 40 years in a bank that offers an interest rate of 6.7% p/a, compounded weekly, an investment is worth \$56783.82. Calculate the principle value of the investment.

F9. Kim is buying a car and wishes to borrow \$13000 from the car dealership. The car dealership offers them an annual interest rate of 4.9%, compounded monthly. They wish to pay this loan off entirely in 3 years. Complete the entries in a TVM calculator to calculate monthly payments.

F10. Kim also decides to invest for the future. They deposit \$2000 into an investment, and then set up a bank transfer to pay \$100 into the investment every month for the next 20 years. The investment pays 4.5% interest per year, compounded monthly. In order to find out how much will be in the account at the end of 20 years, Kim types in these values to a TVM Calculator. Use a TVM calculator to find 'future value'.

TRIGONOMETRY

T1. Consider any angle θ in quadrant III, that is, between 90 and 270 degrees.

(a) $\sin \theta$ is positive, negative or zero?

(b) $\cos \theta$ is positive, negative, or zero?

(c) $\tan \theta$ is positive, negative or zero?

T2. Use the Pythagorean identity to calculate $\sin \theta$ if $\cos \theta = \frac{2}{5}$, given that θ lies in quadrant IV.

T3. What is the quadrant I reference angle for the following angles:

| | | | | | |
|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|
| (a) 170° | (b) 230° | (c) 290° | (d) 100° | (e) -130° | (f) 370° |
| (g) 225° | (h) 315° | (i) 135° | (j) 150° | (k) 210° | (l) 330° |

An *exact value* can be an integer, a fraction, a terminating or recurring decimal or a symbol of a number. If a number is irrational, the exact value must be written with the correct symbol for that number – eg, $\frac{\pi}{2}$, or $\sqrt{2}$ etc.

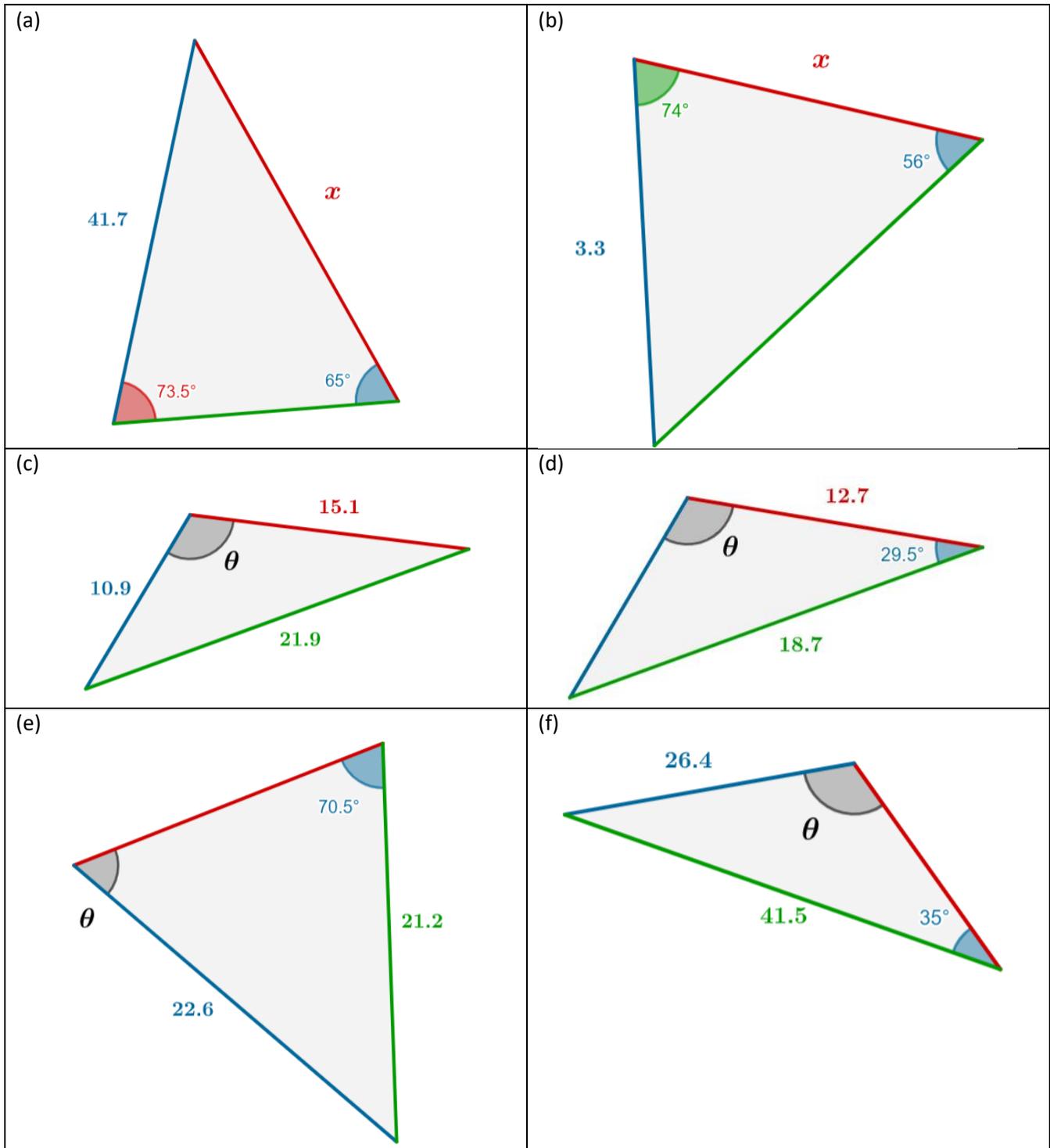
T4. Write down the *exact value* of the following:

| | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| (a) $\cos 30^\circ$ | (b) $\tan 60^\circ$ | (c) $\sin 45^\circ$ | (d) $\sin 240^\circ$ | (e) $\cos 330^\circ$ |
| (f) $\tan 315^\circ$ | (g) $\sin 150^\circ$ | (h) $\tan 120^\circ$ | (i) $\cos 300^\circ$ | (j) $\tan 300^\circ$ |

T5. Solve a trig equation:

| | |
|--|---|
| <p>Let $0 \leq \theta \leq 360$. Solve:</p> $\tan \theta = 0.9$ <p><i>Enter any decimal answers correct to 1 decimal place.</i></p> <p>$\theta_1 =$ <input type="text"/> $\theta_2 =$ <input type="text"/></p> | <p>Let $0 \leq \theta \leq 360$. Solve:</p> $\cos \theta = -0.7$ <p><i>Enter any decimal answers correct to 1 decimal place.</i></p> <p>$\theta_1 =$ <input type="text"/> $\theta_2 =$ <input type="text"/></p> |
| <p>Let $0 \leq \theta \leq 360$. Solve:</p> $\cos \theta = -\frac{\sqrt{3}}{2}$ <p><i>Enter any decimal answers correct to 1 decimal place.</i></p> <p>$\theta_1 =$ <input type="text"/> $\theta_2 =$ <input type="text"/></p> | <p>Let $0 \leq \theta \leq 360$. Solve:</p> $\sin \theta = 0.7$ <p><i>Enter any decimal answers correct to 1 decimal place.</i></p> <p>$\theta_1 =$ <input type="text"/> $\theta_2 =$ <input type="text"/></p> |

T6. Calculate the unknown values labelled x or θ in each triangle:



QUADRATIC FUNCTIONS AND EQUATIONS

Q1. Factor these quadratic expressions:

| | | | |
|-----------------|------------------|-----------------|-----------------|
| $5x^2 + 7x - 6$ | $4x^2 - 11x + 6$ | $2x^2 + 8x + 8$ | $-x^2 + x + 12$ |
| $3x^2 - 6x - 9$ | $3x^2 + 2x$ | $2x^2 - 2$ | $x^2 - 100$ |

Q2. Let a parabola have equation $y = x^2 + 4x - 60$. This parabola cuts the x -axis twice.

Find the two x -intercepts using

- (a) the quadratic formula
- (b) by completing the square, then rearranging to isolate x
- (c) by factoring

Q3. Each of these parabola have two x -intercepts. Find the x -intercepts of the following parabola using any method:

| | |
|------------------------------|------------------------------|
| (a) $y = x^2 + 6x + 9$ | (b) $y = x^2 - 6x - 4$ |
| (c) $y = 5x^2 + 20x + 11$ | (d) $y = -x^2 + 10x - 22$ |

Q4. Write the equation of any parabola in the form $y = ax^2 + bx + c$ that does not have any x -intercepts. Explain how you know that this parabola does not cut the x -axis.

Q5. Solve the following equations using any method:

| | |
|-------------------------------|------------------------------|
| (a) $x^2 - 36 = 0$ | (b) $(x - 5)(2x + 9) = 0$ |
| (c) $5x^2 + 26x = 6x - 11$ | (d) $x - 6 = \frac{4}{x}$ |
| (e) $x^2 - 8x - 1 = 0$ | (f) $(x - 4)^2 - 17 = 0$ |

Q6. Write down the range of the following functions:

| | |
|------------------------------|------------------------------|
| (a) $y = x^2 + 6x + 9$ | (b) $y = x^2 - 6x - 4$ |
| (c) $y = 5x^2 + 20x + 11$ | (d) $y = -x^2 + 10x - 22$ |